

5-3 // Claims 1-3 rejected as being anticipated by ...

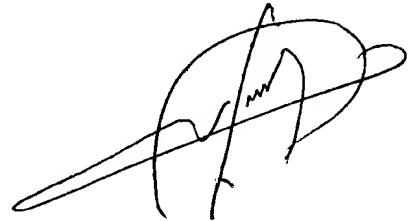
This may be expected but it needs more professional sophisticated comparison on the design drawings ,details , pioneer characteristics and the ways of employing many principles with the independent activities management in this engine to recognize the distinguished differences. #

Looking forward to have your approval on the final formality of this application and to have your comprehensive satisfaction on the operativeness of this device.

Hopefully to have your endorsement for time extension whenever there is scientific inquiry to enable the applicant to get such mentioned Affidavits on this research.

Thanks with best regards

The Applicant



Shirwan AL PASHA AL BAHDAINI

Enc. /

Market up copy of original Ed. & 1st plant Ed. (92 pages)

Market up & clean copies of pages for that Ed. on USP 1st Action to be // for 2nd Action.

and/or with a part fixed in Case and other in the wheel. To interlock together when fixing all parts of the engine, as separate pair of ring pieces fixed in Case, other ring fixed on operating wheel. The seals components would form together a tighten and a sliding device to protect the chambers from any penetration of combustion gases (and maintaining the required closed chamber for all mod of mixture). They could be lubricated with special holes in the right place where is no longer pressure on it, (i.e. end of exhaust opening) or using a self-lubrication seals or as industrial design , (Det. 26, Fig 2/25 & 3/25).

10./ The usual oil pump (and subsidiaries) , which is fixed in the front end of engine (or else). Connected with the crank to transfer oil from lower store oil tank , that receives oil flow coming from Case end, to the upper(middle) oil tank which discharges the intake of the main tunnel in the central crank. In which it has its winging (impeller) parts, in a shape that could direct the flow of oil sucked by tunnel's inlet holes in crank which suck it when rotates to discharge it to pads or pistons in each wheel by relevant holes outlets depending on the Centrifugal concept for each part. These outlets holes to the engine parts in the crank are in a specific design for their opening diameter depending on its relevant distance from main oil supply (Det. 24, 28 Fig 2a/25). The trenches in each pad i.e. grooves will be filled with oil, feeding from Crank holes flowing due to engine crank ration directed outwardly from centre. By centrifugal energy depending on parts-diameter due to its rotation. The grooves in a way contacting side-walls around each power wheel unit, for cooling as for Adiabatic. To provide perfect enthalpy system for each power wheel unit. The oil flow will reduce the heat of cylinders after fuel combustion. The pistons get their lubrication oil with the same principle, from a small tank (sump) in the base of each cylinder as intake store. That will be refilled always (if required by specific opening between the inlet and outlet stores with excess length of its intake rod pump tunnel). The demand of lubrication oil for each piston will be supplied as its movement need. The piston will take sufficient lubrication oil by its lubrication pump fixed in its push-arm that sucks oil with any little movement ,supplying the piston needs. Then flowing and directed out side piston by out flow tunnel to outlet sump ,then far from wheel centre to wheel side wall .Then disposes it in the pad zone to be directed to Case by the same Centrifugal

and/or with a part fixed in Case and other in the wheel. To interlock together when fixing all parts of the engine, as separate pair of ring pieces fixed in Case, other ring fixed on operating wheel. The seals components would form together a tighten and a sliding device to protect the chambers from any penetration of combustion gases (and maintaining the required closed chamber for all mod of mixture). They could be lubricated with special holes in the right place where is no longer pressure on it, (i.e. end of exhaust opening) or using a self-lubrication seals or as industrial design , (Det. 26, Fig 2/25 & 3/25).

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THE CLAIMS ON THIS INVENTION : SHIRWO S. (Last Ed. reply on USP 2nd Action)

30 claims (Ref. to the drawings Fig 1/25 to Fig 25/25 and the prescriptions)

1. An engine comprising a case 2 of cylindrical cavity having at least a wheel 3, mounted and geared on a straight central crank 6, of smooth circumference width to rotate coaxial inside therein, contains at least cylinder 41 or two oppositely on centre-side perpendicularly on crank with central line angle 45° or more on wheel's tangent, it has one side opened outwardly on case cavity wall, a piston 42 inside it with ability of linear movement therein fixed to the closed end by a pair of self interlock rods enforced by a designed elastic metal spring as free piston's push-arm 7, the piston's top face together with its cylinder's wall and internal cavity's wall defining a combustion chamber 1, surrounding circular seal 26 fixed on wheel circumference 4 at each side edge interlocked with the case, three or more of seal mass 19 facing wheel circular width in a designed fixed radial locations on case cavity to isolate stroke performance modes of a chamber which is conducted with a wheel rotation to be fed with air-fuel mixture from inlet 20 via valve(s) 22, to pass on spark plug(s) 9, for exploding its fuel-mixture charge in a particular power zone located away from inlets to make its piston deflects transferring potential force to wheel side for rotating, reaching exhaust pipe opening 30 that contains wings designed to employ Bernoulli's Concepts to let exhaust speedily gases expel through to produce additional relative physical reaction that could act on or in inverse direction to rotate the cylinder within its wheel additionally, then to have air puffing via inlet 21 to clean and scavenge the left exhaust gases to start other new revolution, a pressured air is to feed it after spraying or injected fuel in it by a device 20, feeding with compressed air for the two direction by network of accessories with gas cylinder and compressor, an ignition distributor 33 crank rotation adapted, Inlet valves 21, 22 mechanically timing controlled by edge(s) of circular metal pad(s) 17, surrounding and coinciding sides of each wheel and used for oil and cooling services contain radius grooves to discharge outwardly from central oil canal 24 supplying the case, by centrifuge concept, piston servicing of oil via rod pump 10 working with its sliding push-arm 7 relatively to piston linear movement, linking piston oil network via wheel oil intake on the crank, oil flows back via the case to oil tank 35, where a case has many said wheels discipline each wheel could work separately with independent accessories and automatic control .

2. The engine characterised as in claim 1, has a discipline composing piston, Rotary and Turbine principles, to perform all together in a compound system unit
designed in smooth simple mechanism to provide best utility for fuel combustion potential energy to be transferred to automotive power output .
3. The engine characterised as in claims 1, the said engine is using the new technique of concentrating the reactions of physical dynamic forces occurred in/by elements inside the engine, to be used positively in engine output benefit.
4. The engine characterised as in claims 1, the said engine does not have energy-lost stroke, all piston displacements in any direction will act positively during the work for the benefit of engine output .
5. The engine characterised as in claims 1, this engine is using the exhaust gases potential aerodynamic reactions to increase engine output, by using a technique of utilising physical concept on a modified exhaust openings to reflect as a turbine reaction directly on the engine .
6. The engine characterised as in claims 1, this engine is efficiently using pre-compressed air-fuel mixture to be boosted vertically on the axis of modified turbine(s) contains flexible elastic piston(s) in this spark engine to utilise many concepts together when fuel combustion occurred to provide those different characteristics of piston system as economic and easily controlled, in additional to that best characteristic of Jet system in the speedy accelerated powerful output, to establish connecting bridge on that wide gap between piston engines and Jet engines by this compact system.
7. The engine characterised as in claims 1, this spark engine is efficiently using the pre-compressed air-fuel mixture by almost independent device (separated from engine activities) to be boosted(or supercharging it) to the chambers to provide the best status for fuel combustion in squeezing the power on pistons and to have rapid acceleration in this discipline .
8. The engine characterised as in claims 1, this engine is using the principle of Puffing air on each chamber i.e. piston cup directly at the end of exhaust stroke while still hot for expelling (scavenging) exhaust gases, for reducing heat of chambers in each cycle, providing perfect adiabatic effect, exchanging total exhaust gases and cleaning what could be left of soot, even the pressure and temperature of this air feeding could be controlled, this mission could be

repeatedly done in highly speed perfectly in each double revolution of a chamber as automatically, consecutively and harmonically with other chambers, since the system providing this ability of independent performance.

9. The engine characterised as in claims 1 and relatively to claim 8 this engine is using a built-in technique to reduce the pollution of exhaust gases within the engine, by puffing pressured air directly on the hot gases in each chamber while still hot at each end of its exhaust stroke, which will complete the oxidisation of all exhaust gases i.e. those sensitive CO & NO_x (and SO_x if exist) to be oxidised into environment-friendly status before being expelled to the environment , it is also a way to prevent acid rains, this mission could be controlled by adding extra pollution-treating factors.
10. The engine characterised as in claims 1, this engine using flexible elastic push-arms for pistons with the free various elastic displacements as this discipline utilises them all positively and effectively on the engine output, by a way of maintaining a perfect fuel combustion in each chamber, by providing exactly the required extension for chambers space to act in association with other engine effects as this is a flexibility of this system to use any mix rate (different compression effect) upon any piston while engine in performance, it could use different fuel (in octane factor) without mechanical disturbance, keeping the actual required chamber's combustion space for any fuel, keeping the best firing situation for any fuel efficiency to be utilised, terminating knocking, rumbling problems, this system is providing the flexible harmonic distribution of different fuel combustion intensities in the chamber to be transferred all positively to engine output automotive power.
11. The engine characterised as in claims 1, this engine is using easy way of feeding the air-fuel mixture to each chamber as in the same (uniform) ideal mixture for all by one fuel spraying mechanical device to feed all chambers , or by using a separate (independent) spraying devices for automatic control feeding for each piston unit (or group of pistons) separately in this system to have the precise required fuel in any application performance .
12. The engine characterised as in claims 1, this engine is using a specific principle of distributing oil services from central supply canal(tunnel) inside its straight crank via metal pads by utilising the Centrifugal concept on engine rotation, for discharging oil outwardly to engine case, providing good adiabatic efficiency with

good oil distribution to engine parts related to its speed, the engine oil tank far from hot combustion gases of chambers preventing expected oil smoke due to penetrating of these gases leakage on oil sump.

13. The engine characterised as in claims 1, this engine is using independent device for oil service in each pistons by its private pump working relatively to the piston's displacement, supplying the required oil quantity for each piston,

(for piston wall touching cylinder wall) independently as the piston demands.

14. The engine characterised as in claims 1, this engine is using simple mechanism to bear any power range by transferring it to a sliding free rotating reaction by a straight crank mounted on it wheel(s) consisting piston(s) of flexible elastic displacements, the additional effective reactions which acting positively on engine output by employing a criteria of this system in utilising the advantages of this circular shape of wheel(s) in the engine could be called additional spherical sustained reaction of this system on the said fuel output.

15. The engine characterised as in claims 1, this engine has ability of conducting parts of engine performance needed for any engine application, maintaining sufficient independent parts of engine in work as needed for the required engine output, by the ability in using independent feeding devices for each engine part, providing the exact consumption to reduce fuel for any work.

16. The engine characterised as in claims 1, this engine has the ability of providing auto-output performances, by the ability of controlling any piston performance, any piston could work or stops as required during engine rotation, despite they are all on the same crank, this would be happened without influencing on other parts in the engine, related to the engine design concerning the pistons and/or wheels numbers in engine, and a control of the accessories , this provides the pioneer characteristic of this system

(The Automatic Output Power Engine, SHIRWAN SYSTEM).

17. The engine characterised as in claims 1, this engine is using a specific design of the free flexible elastic push-arm for pistons, with chambers placed in the wheel outwardly circumference, employing the circular shape with its miracle physical advantages in reducing the linear movement of working pistons due to increasing rotary speed of wheel(s) inside engine, the piston's depress decreases with the increase of revolution speed depending on a natural concept of a dynamic circular body rotating and accelerates by consecutive linear force(s)

effects on the same rotary direction which will not stay as the same premier force(s) effect while increasing wheel rotary speed or to keep a constant speed , this criteria will be used to reduce linear force of piston(s) acting on a wheel which would be used to reduce the fuel needs required for the consecutive explosions in chamber(s) having reduction in its expanding, due to reductions of piston(s) displacements, means this system as it is boosting(charging) air-fuel to engine, it will reduce its fuel consumption while increasing its speed by utilising the speed-factor in this physical concept.

18. The engine characterised as in claims 1, and relatively to claim 17, this engine is using the principle of utilising Centrifugal concept directly in highly speeds, to reduce the fuel consumption also, as this connected with the circular placing of the chambers with free movement of all pistons related with the weight of pistons masses and an assumption existing mass for the gases in these chambers, while keeping the same reaction on the wheel(s), at highly various revolution speeds, physical centrifugal reaction will be reflected by gas pad as a balloon inside these mentioned chamber(s) to act again on the same positive direction of fuel combustion inside the engine, this means extra descending in the said fuel consumption with the speed increase in this engine, it means this is a second way of countering the fuel consumption while increasing the speed, the indicator diagram for both claims 17&18 would be used in approaching a theoretical situation of minimum piston linear reciprocated displacement to program a computer control system for actual required feeding to reduce the fuel consumption that needs in highly speed, related to the engine & loading.
19. The engine characterised as in claims 1, this engine is using valves for chambers, controlled separately without using the essential articulated timing connection, e.g. a cam-shaft, this integral system is cancelling the main old slipping stress bearing points those exist on conventional engine's crank and cancelling those articulated parts and their weight in this new engine.
20. The engine characterised as in claims 1, this engine has a discipline seated to provide facile ways in regulating and adjusting all engine activities, i.e. control of fuel consumption, output power, pollution treatment quality, the pre-heating of the engine , oil-cooling system, the use of aerodynamic power in output and the termination of the defected piston, the contact status of radian seal in Case with

wheel(s) as could be controlled mechanically or by thermal adjustment in relation to engine speed or when to be in 'used for Auto-Engine.

21. The engine characterised as in claims 1, this engine could be modified easily for various kind of power output, if keeping the same general dimensions, by only changing the qualification of elastic push-arm for group of pistons or all, with little changes in the fuel mixture feeding device(s) if required that is because of the free circular sliding discipline of the engine to bear any range of potential power and more it is depending on piston elastic push-arms.
22. The engine characterised as in claims 1 this engine could be in wide options depending on this system principal, for various proposals as different in power wheel numbers or diameters, cylinders(piston) diameters or cylinder numbers in each wheel, or even in dimensions of all these in one engine for the wide application Auto Engine, a connected hydraulic system for two pistons in one wheel could be used also to exceed expelling of exhaust gases more rapidly, a differential cross-diameter of push-arms metal spring could be used.
23. The engine characterised as in claims 1, this engine could be used vertically as its crank in vertical direction as a vertical engine performance, that is because the oil services here are depending mainly on the Centrifugal concept, and the air-fuel is boosting to the engine the speedy output efficiency would make this integral compact engine system is the most suitable for the promising small Hoover Craft and other flying equipment . (Fig 23/25).
24. The engine characterised as in claims 1, this engine could be designed in a dual or more ignition spark plugs in big diameters wheels, depending on the same system principal considering all the requirements, the exhaust openings could be placed as required or even used with moving adjustments
25. The engine characterised as in claims 1, this engine could be used easily as a group of different-power unites (engines) on the same crank, to work as one engine for heavily application(generations) each engine could have its own oil services and control, to work or stop without influencing on other because of the sliding rotary design with independent effects of parts.
26. The engine characterised as in claims 1, this engine could use gasoline (benzene) in different kind of octane or Jet kerosene or even Gas fuel in the same principal, the existing of flexible piston push-arm could provide this capability, by just changing the feeding accessories or pistons push-arm.

27. The engine characterised as in claims 1, this engine however controlled by its pressure of feeding its options of Auto-engines for multilateral-purposes in performance could be provided by different proposals of modifications as ,

- A /* Air-fuel mixture feeding pipe with controlled inlet for feeding pistons of wheel (the piston in any wheel- unit) by inlet valve regulator or management,
- B/* Air-fuel mixture feeding pipes with controlled inlet for each wheel unit ,
- C/* Different pistons diameters for any wheel with their particular accessories,
- D/* Different pistons numbers in any wheel with a modified distributor ,
- E/* Different wheels diameters with their particular feeding accessories,
- F/* Different piston push-arms (elastic resistance) for any wheel(s) that might be used in a specific applications as a wheel unit(s) for fast acceleration, high speed or in extra heavily work or idle work, or related to other kind of fuel used,
- G/* Exhaust opening places, angles, for the wheels its wings direction it could be moveable as required and the location of the last exhaust seal ,

28. The engine characterised as in claims 1, this engine is using maximum fuel potential energy in output to be a powerful engine because of ,

- A /* Its longer effect and constant moment of piston Power stroke on Crank,
- B /* Its pistons strokes acting all positively on engine output no stroke lost,
- C /* Its minimum combustion energy lose due to its sliding rotary mechanism,
- D /* Its utilisation of the potential elastic effect of elements inside the engine,
- E /* Its utilisation of perfect combustion for air-fuel mixture in chambers always,
- F /* Its way of using the pressured boosted air-fuel mixture into the chambers,
- G /* Its utilisation of the aerodynamic power for exhaust gases in output,
- H /* Its utilisation of the physical powers reactions occurred inside the engine,

29. The engine characterised as in claims 1, this engine is suitable for computer age since its parts perform independently to fit prepared programs.

30. The engine characterised as in claims 1, this integral engine would eliminate the gear transmission box in a vehicle if used as Auto Engine, it has simple fuel spraying devices, it has safe high speed efficiency as the more speed the less vibration(i.e. less distance of pistons displacements) with high adiabatic efficiency, this system has wide options since it could use those various elastic devices used in refill usual automatic weapons such as canons or machine guns to change those products to mankind civil purposes ! . +++

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chamber as automatically, consecutively and harmonically with other chambers, since the system providing this ability of independent performance.

9. The engine characterised as in claims 1 and relatively to claim 8 this engine is using a built-in technique to reduce the pollution of exhaust gases within the engine, by puffing pressured air directly on the hot gases in each chamber while still hot at each end of its exhaust stroke, which will complete the oxidisation of all exhaust gases i.e. those sensitive CO & NO_x (and SO_x if exist) to be oxidised into environment-friendly status before being expelled to the environment , it is also a way to prevent acid rains, this mission could be controlled by adding extra { anti } pollution-treating factors.
10. The engine characterised as in claims 1, this engine using flexible elastic push-arms for pistons with the free various elastic displacements as this discipline utilises them all positively and effectively on the engine output, by a way of maintaining a perfect fuel combustion in each chamber, by providing exactly the required extension for chambers space to act in association with other engine effects as this is a flexibility of this system to use any mix rate (different compression effect) upon any piston while engine in performance, it could use different fuel (in octane factor) without mechanical disturbance, keeping the actual required chamber's combustion space for any fuel, keeping the best firing situation for any fuel efficiency to be utilised, terminating knocking, rumbling problems, this system is providing the flexible harmonic distribution of different fuel combustion intensities in the chamber to be transferred all positively to engine output automotive power.
11. The engine characterised as in claims 1, this engine is using easy way of feeding the air-fuel mixture to each chamber as in the same (uniform) ideal mixture for all by one fuel spraying mechanical device to feed all chambers , or by using a separate (independent) spraying devices for automatic control feeding for each piston unit (or group of pistons) separately in this system to have the precise-{ly} required fuel in any application performance .
12. The engine characterised as in claims 1, this engine is using a specific principle of distributing oil services from central supply canal(tunnel) inside its straight crank via metal pads by utilising the Centrifugal concept on engine rotation, for discharging oil outwardly to engine case, providing good adiabatic efficiency with good oil distribution to engine parts related to its speed, the

2. The engine characterised as in claim 1, has a discipline composing piston, Rotary and Turbine principles, to perform all together in a compound system unit designed in smooth simple mechanism to provide best utility for fuel combustion potential energy to be transferred to automotive power output .
3. The engine characterised as in claims 1, the said engine is using the new technique of concentrating the reactions of physical dynamic forces occurred in/by elements inside the engine, to be used positively in engine output benefit.
4. The engine characterised as in claims 1, the said engine does not have energy-lost stroke, all piston displacements in any direction will act positively during the work for the benefit of engine output .
5. The engine characterised as in claims 1, this engine is using the exhaust gases potential aerodynamic reactions to increase engine output, by using a technique of utilising physical concept on a modified exhaust openings to reflect as a turbine reaction directly on the engine .
6. The engine characterised as in claims 1, this engine is efficiently using pre-compressed air-fuel mixture to be boosted vertically on the axis of modified turbine(s) contains flexible elastic piston(s) in this spark engine to utilise many concepts together when fuel combustion occurred to provide those different characteristics of piston system as economic and easily controlled, in additional to that best characteristic of Jet system in the speedy accelerated powerful output, to establish connecting bridge on that wide gap between piston engines and Jet engines by this compact system.
7. The engine characterised as in claims 1, this spark engine is efficiently using the pre-compressed air-fuel mixture by almost independent device (separated from engine activities) to be boosted(or supercharging it) to the chambers to provide the best status for fuel combustion in squeezing the power on pistons and to have rapid acceleration in this discipline .
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1. An engine comprising a case 2 of cylindrical cavity having at least a wheel 3, mounted and geared on a straight central crank 6 ,has smooth circumference width to rotate coaxial inside therein, contains at least cylinder 41 or two oppositely on centre-side perpendicularly on crank with central line angle 45° or more on wheel's tangent, it has one side opened outwardly on case cavity wall, a piston 42 inside it with ability of linear movement therein fixed to the closed end by a pair of self interlock rods enforced by a designed elastic metal spring as free piston's push-arm 7, the piston's top face together with its cylinder's wall and internal cavity's wall defining a combustion chamber 1, surrounding circular seal 26 fixed on wheel circumference 4 at each side edge interlocked with the case, three or more of seal mass 19 facing wheel circular width in a designed fixed radial locations on case cavity to isolate stroke performance modes of a chamber which is conducted with a wheel rotation to be fed with air-fuel mixture from inlet 20 via valve(s) 22, to pass on spark plug(s) 9, for exploding its fuel-mixture charge in a particular power zone located away from inlets to make its piston deflects transferring potential force to wheel side for rotating, reaching exhaust pipe opening 30 that contains wings designed to employ Bernoulli's Concepts to let exhaust speedily gases expel through to produce additional relative physical reaction that could act on or in inverse direction to rotate the cylinder within its wheel additionally, then to have air puffing via inlet 21 to clean and scavenge the left exhaust gases to start other new revolution, a pressured air is to feed it after spraying or injected fuel in it by a device 20, feeding with compressed air for the two direction by network of accessories with gas cylinder and compressor, an ignition distributor 33 crank rotation adapted, Inlet valves 21, 22 mechanically timing controlled by edge(s) of circular metal pad(s) 17, surrounding and coinciding sides of each wheel and used for oil and cooling services contain radius grooves to discharge outwardly from central oil canal 24 supplying the case, by centrifuge concept, piston servicing of oil via rod pump 10 working with its sliding push-arm 7 relatively to piston linear movement, linking piston oil network via wheel oil intake on the crank, oil flows back via the case to oil tank 35, where a case has many said wheels discipline each wheel could work separately with independent accessories and automatic control .

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#31 / sub spec us

- SHIRWO SYSTEM -(Plant App. PCT/IB99/00178 - USP)

(NEW INTERNAL COMBUSTION POWER SYSTEM) 2nd edition on 1st action

8/5/03

INTRODUCTION

This is a brief research prescribing practical system for internal combustion engine provides better utility for fuel's energy by a design that could add more potential powers to engine output with perfect control for combustion intensities inside the engine to perform independently in harmonic effect, a system of different technologies associated in a simple economic discipline with wide options, to reduce the actual fuel consumption or to maximise the real potential fuel output.

It has been more than hundred years since that invention of Otto petrol internal combustion engine had appeared, still used until now to supply automotive powers. The fast progress in the world, the economical problems, the lack of energy, the increase of pollution on earth, make it necessary to develop more advanced automotive system, A compact engine that could convince the environmentalist organisations and the consumers ambitious to use a system depends on improved techniques to suit the computer age, in the main time providing methods to get use of those huge industries of regular weapons products, to be for civil efforts. Thus such advanced system in specifications, economic and has best utilisation for fuel energy with less pollution effect, is required to provide a promoting solution for the near future problems, (referring to 'Kyoto' summit 1998 about industrial pollution).

A new environment-friendly generation of clever combustion engines is about to be appeared, it depends on a solidarity of many scientific concepts, some defining natural events or has been used in atmospheric flying missions, even beyond it in the space away from earth's gravity; all inside this compact automotive discipline.

It was the inventor's dream ten-years ago to become true at the same time when an industrial community like US Gov. had appealed on 1995 to find more advanced automotive system for the future. This powerful system is flexible in operation and harmonic in performance, An automotive engine, that could become so close to Man's orders as much as close to alive object in work , than just a machine.

This system utilises various scientific concepts participated in its missions of performance, it needs professional experts in I.C. automotive , mechanics, hydraulics, aerodynamics and essential in physics knowledge, to be able to assess together the compound conclusions implied in the **criteria** of this power system.

1 → 51 P. + 25 Drawgs.

Of course more diverse scientific researches in classified industrial laboratories would be needed later on for developing its various and wide options mathematically and practically (by using computer formatting). In order to reach the best commercial standards in using this system for different kinds of applications .

It's time to reconsider the way of using the potential energy of Petrol fuel in producing automotive energy for power engine equipment. In away to improve the energy of fuel combustion in engines, to make it in its maximum useful potential advantage to produce automotive power, by employing some natural universe concepts inside engine discipline, using advanced techniques depending on wide scientific knowledge to make these concepts employed under control inside the engine to be utilised to provide more output power for the fuel in the power engine.

Hopefully this could be a real useful automotive system to solve some future problems by a better way in utilising Petrol -God's generous gift to the mankind - the best powerful available cheap fuel material in the earth, in this economic design which is suitable for the future strict regulations and workable for computer age to fit the 21st century to be declared and invested for mankind peaceful purposes.

This research :

This brief research contains: description, design's principal (back ground), major changes, compositions & accessories, typical engine performance , conclusion of analysing potential ways of producing torque power, useful industrial & commercial characteristics, various design proposals, drawings contents, drawings(Figs) details , abstract and then the Claims, all on 51 pages plus a set of 25 Drawings. (*Inventor personal wording prescribing most considerable sides of this invention.*).

..... **DESCRIPTION**

S-H-I-R-W-O : (SPHERECAL-SUSTAINED / HARMONIC-HYDRAULIC/ INDEPENDENT-

I.C. - INTENSITIES / ROTARY-REFLECTED-REACTION / WHEEL(S) / OPERATING)

S. : System : A SPECIFIC MECHANICAL DISCIPLINE TO MAKE THIS AUTOMOTIVE ENGINE WORKS TO PRODUCE TORQUE OUTPUT (FROM FUEL ENERGY).

A new internal combustion compact power engine in a discipline providing smooth sliding mechanism with flexible performance using the fuel potential chemical energy for internal combustion in relation with additional effects due to employing techniques of using Natural Physical dynamic forces inside the engine to provide better output from the said fuel, a system consisting many theories

working in association inside a simple mechanical discipline to utilise the maximum fuel energy for automotive power output, with minimum energy lost, in the meaning of reducing said fuel consumption related to weight-power ratio for engine output.

This system is designed to achieve the best mechanical way in transferring fuel combustion to automotive reaction, by using all known principles in one time with minimum power lost inside engine, moreover it provides ways to use physical effects which appear due to elements dynamics inside the engine to be utilised for its output benefit. This practical engineering design composing types of the recent combustion principles (those used separately to produce automotive power) the piston, rotary and turbine to perform all together as one compound system in this compact engine unit, and adding to it new principle of employing the inside physical dynamic reactions of engine's moving elements; all to provide maximum fuel utilisation in output. The system is a simple discipline using wheel(s) mounted on straight crank inside a case to rotate therein, the wheel(s) contains cylinder(s) for piston to move therein, the piston has a chamber defined as the space between piston top and the case internal wall with the cylinder bore surrounding the piston top, the piston is mounted inside the cylinder by free flexible push-arm connected it with cylinder base, to hold the piston and to transfer its flexible movement effects to the cylinder base then to the wheel containing it, with designed ways of isolating chambers, adapting services and conducting the parts in this discipline. This engine system produces torque power from Hydrocarbon combustion energy, by utilising the extension and pressure of emission gases after fuel combustion in closed chambers. In addition to that, this integral engine discipline will agitate and concentrate physical forces which appear inside the engine i.e. aerodynamic force of exhaust gases and physical dynamic effects of moving elements, to transfer these component forces as one resultant acting on the same target to apply more potential power to the combustion power of a said fuel. This system is designed in away to be flexible and harmonic in performance and could use any type of gasoline(octane)for fuel or Jet kerosene or even the gas fuel, dealing with fuel chemical energy in high efficient manner and adding to it - what could be said the indirect or invisible -inside physical powers(the resultant could be called the spherical sustained reaction). This system is using new technologies to arrange methods for employing natural physical concepts to be implemented inside the engine then invested practically for the benefit of the engine output.

THE PRINCIPAL OF THIS SYSTEM DESIGN (Back Ground) :

The conventional piston combustion engines depend on cylinder bank of pistons fixed in engine case (chassis) using reciprocated push-arm between pistons and a zig-zag crank shaft connected with them in determined angles by mounting frictional minimising metal pads, transferring torque to the crank depending only on I. C. effect on pistons via push-arms in direct contact movement to produce power.

In fact those systems depend on fuel explosion but its effect should be always limited relatively with the constant piston displacement in cylinders -at all times - no matter how engine situation is, as their designs connecting all pistons with the crankshaft that is way their main problem is to provide precise ideal mixture control with its complications in order to keep equal displacements on all pistons always .

Those conventional engines depending on the direct reactions of fuel explosion-pressure power happened in the chambers only, depend on articulated mechanism neglecting other effect of physical forces that happen due to elements movements.

Although those engines have high rate of fuel power lost inside because of their machinery, appeared by the meaning of bad side-effects as friction, heat, vibration, noise ..etc. , causing a lost in part of fuel output in these engines, there is still no conventional engine design tries to concentrate physical dynamic forces happened inside automotive engine after fuel combustion to be used positively in its output.

This new design is seated in a discipline to use potential power of fuel combustion occurred inside pistons chambers as direct contact on its pistons with ability of flexible displacements (not constant displacement), to transfer any range of fuel power, beside employing natural physical concepts inside the engine by a design devolving its elements to agitate then deliberate these concepts, to have their effects acting consecutively positively to provide effective physical potential influenced forces to increase the final engine output.

The effective physical resultant power (at a typical mod) due to reactions of :

1. Natural elastic characteristic of elements (elasticity of push-arm and gases).
2. Natural aerodynamic force of gases by the potential effect of exhaust gases.
3. Natural centrifugal potential power of rotating parts (appears at high speed).

This system arranging ways of utilising physical forces appeared consequently due to fuel chemical combustion energy inside this compact internal combustion engine, in the meaning of making these reactions working for the benefit of fuel

output, by concentrating the physical dynamic effects of inside elements movements instead of losing them as a lost energy inside the engine (as in conventional engines). This design is seated to employ and utilises natural physical concepts by making them appeared within the inside element movements in away to use the reactions as components acting positively in producing spherical effected resultant on the same target of fuel to apply additional torque on the straight crank of this engine, to magnify said fuel combustion power in output, in relations to the engine design and/or speed and load situations. This new compound concept is working in association with the fuel combustion inside this integral mechanism engine with its easily controlling ways; will increase the said fuel output or reduces said fuel consumption for any application.

The system mechanism will transfer all physical powers occurred inside engine to a kind of spherical resultant added to fuel combustion which already will be transferred to produce final torque output inside this system in a way keeping minimum energy (i.e. combustion power) lost inside this engine due to it's simple machinery (recent systems have loss rate of 15-40% due to their machinery as friction, heat & noise) which will be affected on the power-weight ratio in out put . This system is dealing with almost total potential fuel combustion's energy to be transferred to torque power, in a discipline providing perfect adiabatic efficiency .

The system is investing speed as a physical factor to reduce its fuel consumption.

The main seen achievement on this power system was in existing independent power units in a flexible engine that any part could bear different ranges of fuel power or even stop without disturbing the engine mechanical efficiency keeping harmonic performance with its ability to have automatic control for engine parts.

This is a **system** of any piston (or group) can work independently maintaining smooth engine performance without disturbing its efficiency to be as **auto-power** engine unit for various applications. a system utilising the inside-engine potential physical powers for the benefit of engine output and could counter said fuel consumption in highly speed. The conclusions on this system would observe many good characteristics such like: better output performance, less fuel consumption, automatic power, a built-in pollution treatment, computer control for the engine activities, the long duration for easy maintenance with variety of design proposals, All these could be found in this simple fabricated compact engine system.

MAJOR CHANGES (IN TECHNIQUES) :

The techniques in this principal totally differ from those used in the conventional systems (Otto, Diesel, Wangle and those with modified DOHC, SOHC or even Turbine or Jet system). The main change is in the participation of the systems of piston, rotary, turbine with the novel principle of utilising the benefit of physical effects inside the engine, to perform all together in association, to produce a better output and/or to increase the fuel efficiency in a compact engine. The changes are:

A system of various power stroke, one or two or three or more piston power strokes as required (on the same part of crank) at one crank rotation, no energy loss stroke for all pistons displacements i.e. all react positively on engine output .

A system using straight crank shaft and wheel(s) mounted on it contains piston(s).

A system of independent piston performance related to crank or other pistons.

A system of free flexible (elastic) piston push-arm to transfer potential energy .

A system using pre-compressed air-fuel mixture to be boosted it to a spark engine.

A system composing piston & rotary & turbine performances inside one engine.

A system that employs & utilises Natural Physical concepts forces in its output .

A system utilising aerodynamic power of exhaust gases to act as a turbine output .

A system that could reduce the high fuel consumption; due to the speed increase .

A system of less fuel combustion energy loss due its simple sliding machinery .

A better fuel combusting in all engine situations using flexible-space of chambers .

A system could be used in horizontal or vertical way relatively to the torque shaft .

A system treating pollutant in a practical way with a built-in techniques in engine .

A system bears different power ranges in harmonic performance for various speed.

A system leads to set automatic-parts performances as auto-output engine unit .

A system of discipline provides high adiabatic efficiency inside automotive engine.

A system of efficient conducting for its activities to be suitable for computer age.

The pioneer characteristics of this system could be concluded and practically approved by analysing the main scientific concepts implied inside, which are in :

I. C. , dynamics, hydraulics, aerodynamics, physical concepts, powers analysis, metals technology and pollution treatment, these sophisticated subjects are associated in the performance of this system which required various mathematical equations more than those used in the regular systems, to achieve the required criteria for each option on this compound but easily fabricated automotive system.

THE MECHANICAL COMPOSITIONS & ACCESSORIES OF THIS DISCIPLINE

Compositions as per the enclosure typical drawings of :-

An Engine of three wheel units -of 2 pistons in each wheel using Gasoline :

- 1./ Out side Case (the engine body chassis) a metal cylindrical or octagonal shape (or as the drawings) with a diameter of 330-380 mm in horizontal-position on crank and approx. length (in drawings) of 550-650 mm has a large cylindrical cavity of 301 mm. Contains trenches for seals, tunnels for oil, water and places for valves with special exhaust opening, design & assembling requirements may divide it in parts upper and lower or more, and could permit to cast it in two layers of different alloys with trench's & tunnels. (Det. 2 , Fig : 2/25 & 3/25, 4/25)
- 2./ The crank (as main crank shaft) a torque output shaft is a straight solid steel iron, placed on the horizontal central line of the engine along the Case length and extended more, its diameter 25 mm-50 mm .The connecting points with the Case by ball bearings, which allow it to rotate only on its centre line. It contains central oil tunnel in its centre line, contains holes for linking oil feeding the rotating parts. Its surface geared (grooved) to interlock, trinket with the rotating parts to move coinciding all together as one system. (Det. 6, Fig : 2/25 & 4/25)
- 3./ Power wheel unit (flywheel unit) a metal wheel (3 in the drawings) is a solid strong light alloy wheel, a diameter of 300 mm and a width of 100-120 mm with circular circumference strengthen by scratch-resistant alloy, contains (here) two cylinders(for piston) with an outwardly opening placed in centre-side in opposite direction perpendicular to the wheel axis, each with smooth internal surface bore and diameter (here) 80 mm and length of 120-180 mm its central long axis making angle on wheel tangent larger than 45 degree . A piston placed to move in each cylinder adapted with its base, this has two small oil stores (sumps) one which receives oil by tunnel linked with central supply tunnel (canal) in crank for intake oil store to feed piston via piston-arm. Other for outlet oil store receives oil via piston-arm then to dispose it by a tunnel into wheel side. The feeding intake oil store kept in a full mod always, from canal linked to centre of the wheel within Crank oil tunnel. If required a specific hole with outlet oil store. There are two washers around the crank on the two sides of each wheel for oil lock. There are two edge trenches in the circular circumference face of the wheel fixing a pair of two sides circular wheel gas-oil-slider seals. The number of

wheels the diameter and cylinders depend on the design and output ability of the engine applications. The direction of the cylinders centre line in a wheel differs from a nearby other wheel's cylinder in a known angle that could be found from dividing 360° by the numbers of the total cylinders in performance for the engine. The crank may be geared with wheel according to the wheel numbers for easily angler assembling that starts with all rotating parts in the relevant required angles then ball bearings particularly i.e. all rotating parts to be geared on the crank, by pressing them exactly at the designed angles before fixing the crank in the Case position. The manufacturing of power wheels units would be done by casting alloys with modified geared hole to interlock with crank, drilling oil tunnels, trenched on edges, a smoothing circumference and cylinders bore for pistons these with Case tunnels design would be the standard mass production lines for any engine proposal . (Det. 3, 41 Fig 2/25 & 5/25)

4./ The pistons: each one is from high resistant light disk of solid metal alloy, fixed inside the cylinder with 20-35 mm thickness nearly the same cylinder bore. It contains grooves on its circular wall for seals of gas and oil. There are two middle tunnels oil inlet and outlet inside suitable in linking the build-in oil pump on push-arm device from top end with piston, other smaller radial tunnels linked separately with each of these two middle tunnel horizontally to piston circular edge (to oil gap)to cool piston and to distribute oil to piston wall contacting cylinder wall. A special lubricating seal or two in the oil gap on piston wall to uniform the lubrication on piston circumference wall with cylinder wall, for good slipping movement, minimising friction and heat for the main anti gas and oil seals while piston in movement. The piston is connected by washer-bolts with its solid bearing base plate that capping the flexible push-arm beneath piston. A solid steel ring at the top of the cylinder wall fixed in a groove to lock the piston in the cylinder if required, A suitable curved top capping piston face is required to provide a suitable chamber shape, manufacturing of piston by costing alloy with designed tunnels, grooves and seals ..etc. (Det. 7, 41,42 Fig 4/25 & 8/25).

5./ The flexible piston push-arm is two pair of stainless steel pipes slipping inside each other (or 1 pair) fixed vertically on cylinder base inside its bore by two washer-bolts. A metal spring (straight or inclined) around or a built-in with the push-arm body, is reinforcing it, the push-arm job is to maintain a linear

piston's movement, it is designed to work freely as an elastic resistance for a certain required reactions (capacity) for each proposal depending on engine data, it connects the piston and wheel at the cylinder base for linear variable designed displacement distances inside the cylinder cavity, without being guided or guarded by essential mechanical cam shaft in the engine, also it could be of liquid hydraulic device working as elastic resistance i.e. similar to the devices used in automatic re-fill weapons as fast guns, (Det. 8, Fig 4/25, 8/25 & 11/25).

6./ The oil pump for piston,(piston's private oil pump) is made from a sliding pair of pipes each of small stainless steel pipes slides in each other contains inside tunnel for oil, consists one way oil valve (check valve) in each inlet, or in opposite direction (a valve, using solid small ball locked in a longer size chamber of a curved end as a shape of the ball's half spherical shape with a smaller opening and other opening of many small holes to let the oil flows in one direction according to piston movement).To act as simple rod (shaft) pump due to the piston movement (with push-arm),sucking oil from the main oil canal in Crank via the inlet oil sump in the cylinder base, supplying oil to the piston then disposes it to wheel side-wall. A pump of two pair with opposite flow mounted inside the same push-arm device as in the drawings.(Det. 10, Fig 4/25 & 8/25).

7./ The cooling & oil pads: each one is of light alloy plate of 10-30 mm thickness circular shape geared with the Crank attaching each wheel side-wall has radial trenches, (i.e. grooves) facing the wheel side wall, starting from central zone(pad sump) to the edge outwardly, coincided on wheel has about the same diameter and to act as a centrifugal pump (turbine), an inlet hole in the central linking oil from crank central canal via crank outlet which coincided with to feed oil to pad, then oil is distributed via grooves on wheel walls ,cooling wheel side-walls then disposed to the circular edge then to outsider at top portion of Case to oil service tunnels, (an air opening in ceiling of main oil tank is provided), the pad contains at its last circular modified smooth edge, lower (or higher) zone(s) in certain places against its relevant chambers, for controlling the mechanism of slipping bar timing mechanism for the engine feeding valves as rotates with the crank against the chambers in the right time, kept moisturised by oil always, providing independent mechanism feeding for each wheel. The other duty of pads to provide adiabatic efficiency for engine,(Det. 17, Fig: 3/25 & 7/25).

8./ The radian seal masses (anti-gas), fixed in the Case: each from metal alloy (or hard anti-heat plastic or carbon combination) designed according to its work, which is the anti-gas seal attached the wheel wide circumference face in coaxial to the Case. The principle of these radian seals by contacting wheel circumference and keep on sliding on it attaching the two circular wheel edge seals (the Case part) at wheel sides to provide a closed situation for any chamber in that portion to keep constant mod (stroke) in that chamber independently for each wheel i.e. preventing gases of chamber from penetrating while its wheel rotating. A right depth fixed from outside on the case by a special locked washer and each could be adjustable for contacting (attachment) with the face of wheel by a mechanical control spring regulator or (automatic thermal regulator). For a metal alloy it could be designed in a special way using linear metal seals, fixed on a base to provide a mass of seal in that portion, with various technique methods of oil services using the advantage of a one way rotation of the wheels and oil discharge keeping on flow in the Case during engine work. (Fig 20/25) .

A relation with rotating direction and existing of special small inclined trenches on the wheel surface in the right places (or on attached pin-mass unite) with automatic opening for oil inlet and outlet holes. This could be applied with timing pins in the rotating parts. Using the advantage of one way rotation monitoring oil discharge from Case (or on wheel side phase) starting before entrance of the seal and disposes, while wheel rotates at a duration enough to lubricate attached zone particularly. This could be guarded with spring solid balls in specific place with each mass with a timing system controlled by edge of one side pad of each wheel,(or the wheel it self) . Another way by applying holes in the circular anti-gas seal system, the special timing controlled opening system depends on one way rotation, using circular interlocked parts with holes at these seals. There are special holes on each blade ring that opened across as one hole when seal blades meeting all in one fixed point(s) to set across opening hole for oil feeder from Case to these seal masses at required places. The direction of rotation and trenches in zone of wheel surface will collect the oil drops rapidly to the inlet holes (automatically opened) by specific techniques on the circular seals which fixed on the wheel edges before gases attend to reach

the seal mass, from the coming chamber and before even the chamber reaches the seal position, maintaining surface in a good slipper. However the gases pressure direction may be used to dispose the oil in the right time. **The number** of these seals 3 to 4 for each ignition duration and the radian distance between each one is less than the net radian distance between wheel chambers as the distance of specified attached surface, in any way providing various lubrication technique depending on the expert of industrial laboratories.

The working principle of these seals in their designed positions around the wheel is to maintain and to transport the locked-closed situation of chamber(s) i.e. keeping same status of mod in chamber ; while the wheel in rotation.

These seal masses are in three types of jobs (to work in relative to) :

No, 1 for one way anti-gas of air-fuel mixture; before starting the feeding operation on chamber and the place directly after pure air-valve in the Case.

No, 2 for two sides anti-gas, a side for the zone of charging air-fuel mixture, other side for gases of chamber after combustion, a place before power stroke.

No, 3 for anti-gas of the combustion gases at a place before exhaust stroke starting penetration from exhaust opening with particular specification .

The essential radian distances between seal masses shown in (Fig -10/25)

The size of any seal mass could be designed on bigger bas in order to allow a piston's maintenance preparation from the Case via this opening ,i.e. without open the engine Case to simplify any piston maintenance and push-arm device (also seal No, 3 could be repeated), (Det. 19, Fig 4/25 & 5/25 & 10/25 & 20/25).

9./ The circular anti-gas seals(wheel-case-slider, seals) on the two side's edge of each wheel's circumference, designed as required, a suggestion of suitable two or three stainless steel blade rings mass fixed in specific grooves in the wheel and/or with a part fixed in Case and other in the wheel. To interlock together when fixing all parts of the engine, as separate pair of ring pieces fixed in Case, other ring fixed on operating wheel. The seals components would form together a tighten and a sliding device to protect the chambers from any penetration of combustion gases (and maintaining the required closed chamber for all mod of mixture). They could be lubricated with special holes in the right place where is no longer pressure on it, (i.e. end of exhaust opening) or using a self-lubrication seals or as industrial design , (Det. 26, Fig 2/25 & 3/25).

10./ The usual oil pump (and subsidiaries) , which is fixed in the front end of engine (or else). Connected with the crank to transfer oil from lower store oil tank , that receives oil flow coming from Case end, to the upper(middle) oil tank which discharges the intake of the main tunnel in the central crank. In which it has its winging (impeller) parts, in a shape that could direct the flow of oil sucked by tunnel's inlet holes in crank which suck it when rotates to discharge it to pads or pistons in each wheel by relevant holes outlets depending on the Centrifugal concept for each part. These outlets holes to the engine parts in the crank are in a specific design for their opening diameter depending on its relevant distance from main oil supply (Det. 24, 28 Fig 2a/20). The trenches in each pad i.e. grooves will be filled with oil, feeding from Crank holes flowing due to engine crank rotation directed outwardly from centre. By centrifugal energy depending on parts-diameter due to its rotation. The grooves in a way contacting side-walls around each power wheel unit, for cooling as for Adiabatic. To provide perfect enthalpy system for each power wheel unit. The oil flow will reduce the heat of cylinders after fuel combustion. The pistons get their lubrication oil with the same principle, from a small tank (sump) in the base of each cylinder as intake store. That will be refilled always (if required by specific opening between the inlet and outlet stores with excess length of its intake rod pump tunnel). The demand of lubrication oil for each piston will be supplied as its movement need. The piston will take sufficient lubrication oil by its lubrication pump fixed in its push-arm that sucks oil with any little movement ,supplying the piston needs. Then flowing and directed out side piston by out flow tunnel to outlet sump ,then far from wheel centre to wheel side wall .Then disposes it in the pad zone to be directed to Case by the same Centrifugal concept. The oil grooves and outlets for each pad to the Case as per the design. (Det. 10,11,15,17,28 Fig 2/25,3/25).

11./ The valves of air-fuel mixture and pure-air, air pipe-valves: are of same similar shape with mechanical control on the case, each is in a separated short pipe device contains valve of a triangular with a wide back opposite to the air pressure supply direction. A triangular or curved shape against each wheel circumference in the case opposite to a same smaller graded shape opening. It is guarded by a spring. The place is in Case wall in a sufficient distance before firing zone for feeding chambers directed at central of the wheel circumference

surface and to be opened at the right time against the chambers. They are controlled by the rotation of cooling pad(s) in a side of each power wheel. A simple mechanical elastic rod system connected within the cooling pad modified edge. There is a small smooth roller on rod end that (which is oil saturated) attaching the pad differential edge for timing the opening. By the meaning of lower (or upper) zones on the pad edge using this mechanism to transport and controls the opening movement to valves. (Det. 20,21,22, Fig 4/25 & 7/25).

The air-fuel mixture valve is to supply and feeding the air-fuel mix to a chamber. The pure-air valve is to puff the air to a chamber while still opened for cooling and expelling the exhaust gases from chamber for air exchanging mission.

The two valves in each wheel boosted consecutively with pressured air by one device into their pipes from the same resource i.e. pressured air cylinder or centrifugal compressor or turbine powered by engine rotation as it needs.

The principle of distributing the air between the two pipes for chambers, its differential angles (i.e. different timing), maintaining the required pressure for both air-fuel mixture and puffing on a chamber(or adjusted) at various speeds. The controlling requirement done by using outlet opening regulator of pressure release for main air supply(i.e. a reducing of that opening in higher speed means more pressure to engine) by using this before air enters the two pipes. The fuel will be splashed at exact mixture or various rate (as required) on the pre-compressed air directed to chambers to supply the chambers with fuel mixture before firing it inside chambers in fire strokes.

The fuel splashed could be done by a simple spraying device of a needle valve(s) or a simple sub- carburettor or by mechanical or electrical computerised system as indirect injection as pre-mixed air-fuel mixture in feeding engine or in sub-store for each chamber (or direct injection at feeding zone on the wheel).

12./ The ball-bearings fixed in engine Case for holding the Crank by connecting it with Case from two end sides or more . (Det. 27 Fig 2/25 & 3/25).

13./ Water pump is as known in the front side of engine (or out of engine) with its outer radiator and pipes, with Case water cooling system tunnels (canals) to cool the returning hot oil and all engine Case. (Det. 23 Fig 2/25, 3/25) .

The air cooling system could be used instead of water with required tunnels or wings on the Case reinforced by air turbine to discharge air towards the Case.

14./ The exhaust opening is in the Case for each wheel : starting with a small graded increasing in opening with direction of rotation in a special aerodynamic angles ,meaning specific wings designed in the outlet of exhaust pipe in order to make the escaped gases at exhaust stroke take penetration position in a perfect way to produce a potential aerodynamic reaction on the wheel to act on the same direction of rotation depending on escaping balloon concept on chambers. The principle used here is to reverse the flying principle which utilising the fast air produced by plane fan to produce fast air turbulence on the air-plane wings to fly. In this design an assumption of a fixed fan (the exhaust specific opening) will be under fast air reaction(the exhaust gases, under its pressure and due to piston elastic depressed push-arm). The wheel is free to move (as air plane) i.e. wheel will be under reaction of an excess potential power to be rotated, assuming Case moved in relation to wheel put really the wheel moves, in reversing situation. This specific opening connected strongly with the case and exhaust pipe for each wheel then connected with the main exhaust pipe and could be moveable mechanically for changing its specification and angle depending on various calculations of engine data. (Det. 30, Fig 4/25).

15./ Ignition distributor as known, put any contact point has two contact points against each other for each wheel on the circular distributor, as the number of pistons in each power wheel units (depends on piston/cylinder No i.e. a triple in equal angle if a wheel has three cylinders and so on) . Using the same angle distribution for the pistons in whole wheels each one connected by one cable to its spark plug. The rotating conductor could be (here) faced each contact point twice per one cycle to spark two chambers every one cycle. (Det. 33 Fig 3/25).

The ignition distributor could be placed and mounted in a suitable place to rotate by pinion device with the required relation of engine Crank rotation.

For engine of one large wheel with many pistons (cylinders), by using usual one contact point, with the same angle distribution, using one cable for each plug as two for dual ignition and so on , and could be used easily.

16./ The accessories & sub devices :

A cylinder stores relative compressed air with a compressor pump for recharging working with the engine rotation by a belt, to feed the engine with pre-compressed air. If a compressor in a vehicle could pump its tyre with the

required pressure, why not using this method to charge pre-compressed mixture to this advanced compact engine !. A centrifugal turbine fan connected directly with Crank could be used to supply the pressured air to this cylinder. This **cylinder** should has a sufficient air pressure before the first engine performance. The charging air supplement to both air-fuel mix and pure air for the chambers, the types of air temperature could be controlled. A mechanical and/or electrical controlling device for air pressure, connected with the accelerator pedal of the driver cabin. A modified turbo charger may be used instead which is depending on pre-heated and compressed by exhaust gases speed and heat but it may be not working in the same perfect efficiency for this system which needs pre-compressed mixture.

The fuel spray injection device instrument to splash it in the compressed air using the simple natural spray principle on a liquid (i.e. the acclimatisation), depending on volatile of the opening and the specific density of fuel. This is the indirect injection way of engine charging of air while still in its way to chambers. Maintaining idle (very slow engine workability) by electric needle valves works with ignition by electric device. In this way any kind of fuel octane could be used since the flexible push-arms are used also. A mechanical or electrical device system, can be used as one unit for all chambers requirements since it is using same air pressure controlled by a simple accelerator pedal from driver cabin .

A separate pipe-opening regulator for fuel-mix valves in each wheel unit requirement, is in using the controlling system for automatic engine(or using independent fuel injection on supplying pipe or a store in each feeding valve), (or using direct chamber fuel injection with its device for each wheel, fixed in the case ,as this could be more complicated devices connecting on the case).

The charging air could be pre-heated using a device with electrical heater or utilising the exhaust emission heat by attached device within the exhaust pipes.

The charging compressed air pipes should bear the maximum required pressure for engine application with a safety factor. (Fig 21/25 & 22/25 & 23/25)

17./ The assembling method (compositions set up) is starting with the main crank mounting on its all ready wheels and their pads by pressed together on it as the required angles. Placing other parts and required circular seals on the wheels and fix them in the grooves of Case parts then coming other accessories.

THE ENGINE OUTPUT POWER TYPICAL PERFORMANCE

As for (Fig 4/25, 5/25, 6/25, 7/25, 8/25 , 9/25 ,10 /25 and Fig 18/25) .

1. The engine starts to rotate by a starter motor-accessory fixed near an end side of the engine, by a starter switch for few seconds
2. All the inside parts will rotate, the valves start the work due to the automatic system of controlling the opening a giants each chamber in power unit wheels. Feeding the air-fuel mix, controlled by accelerator of driver pedal and its (idle) working feeding or a bit more ; to the certain chamber by opening its valve at the exact time with the programmed mechanism by its pad via connected taping bar, the air-fuel mix is compressed in chamber i.e. space over a piston, the continues rotation will make this chamber at a place opposite the spark plug. .(a comparison with Otto system !)

**(as suction stroke) ... piston moves downward in (Otto system)*.*

{fuel feeding-charging zone }... piston still without move herein (Shirwo S.) .

3. The chamber will be filled with pr-compressed air-fuel mix. that maintains in pressured situation since the chamber locked by Case wall and piston and radian seal-masses from two sides contacting circular wheel circumference coaxial with Case cavity, as designed radian position of seal masses for each wheel contacting its circular circumference will keep chambers mod in the required closed situation . When the chamber reaches the spark plug .The air-fuel mix sparks instantaneously by ignition timing distributor. It will explode to a large volume of gases then put off. A produced gases which need to expand to their natural large volume, but they are in closed chamber, causing high pressure power on surrounded walls and piston. Piston has the flexibility of start moving to be depressed inwardly due to its elastic push-arm connected beneath, to cylinder base, causing stress on this spring in the best typical way due to gasses pressure on piston then depressing it then charging energy to this elastic push-arm, (the following missions will happen rapidly).

**(firing stroke), piston moves downward, Enthalpy, starting power stroke (Otto)*.*

{firing stroke}, piston moves inward , Enthalpy , starting power stroke (Shirwo S.).

When the piston depresses inwardly, the elastic push-arm will transfer a part of this stress to the cylinder base (wheel side), causing rotation of the wheel, depending on its capacity, the rest of this stress on spring will be stored as constant pressure with charged resistance of the piston push-arm to be used later on aerodynamic reaction of exhaust gases (this is one duty of the elastic push-arm here).

4. As part of reaction caused by push-arm acts on cylinder base on wheel centre-side will push the wheel to rotate by piston displacement as moves inwardly due to combustion gases emission keeping a constant pressure in the chamber, ,
(power stroke) piston moves to constant displacement ...high Enthalpy (Otto)
{ power stroke -1st power zone)piston in variable dsplt., high Enthalpy, (Shirwo S.).
 Since firing stork is happened and finished when explosion is previously burned all the air-fuel mix and has put off rapidly keeping chamber(s) extent space stand still in high constant pressure without flame before reaching the last exhaust seal mass.
5. Due to this rotation of the wheel, the chamber will cross exhaust seal reaches the opening of enlarging trenches which graded in the same rotation direction. The emission left gases which still in high pressure inside the chamber (as the piston is in depressed situation i.e. inward situation), will cause additional power effect on its wheel due to the rapid escaping of these gases from the chamber via exhaust pipe.
** (exhaust stroke-end power stroke)piston moves up, Enthalpy,.. power loss,(Otto.)**
{exhaust stroke-2nd power zone} piston release, Enthalpy, ..exhaust power, (S. S.)
6. The additional stresses (invisible or indirect) which act positively on wheel are :
 - 1st the stored energy of spring (resistance) will attempt to be free causing power on gases (against piston) in chamber and due to circular Case inside-wall (chamber back-wall), and the uniform pressured gas physical characteristic of chamber gas pad (still closed chamber while moving along circular wheel edge zone) that will counters the reaction; this potential force will be reacted positively on piston direction which will provide simultaneously additional continuity power to keep on rotating the wheel in the same direction .
 - 2nd at the time of gases start to penetrate from the graded exhaust opening and due to start losing of gases pressure in a chamber the present compressed elastic push-arm (for piston) which has been already charged inwardly due to fuel explosion in chamber before; will start rapidly to return to it's first position (normal situation) pushing the piston outwardly again, that will push also the remaining gases still not manage to totally penetrate to escape faster, this will cause potential reactions on the wheel by the elastic push-arm reaction to get its release situation , reacts in two direction i.e. on cylinder base means on the wheel and on outwardly piston, (to form additional reaction to rotate the wheel).

3rd the locked pressured gases which reach the exhaust zone, start to penetrate via exhaust graded opening and will be discharged fast causing Aerodynamic force to drive the chamber (i.e. cylinder) in a place that all gases manage to escape rapidly as escaping balloon concept (the flying concept in reverses way e.g. exhaust opening has wings seated in specific effective design and direction), which acts with more reaction on wheel (additional reaction). So :

**(upward d. pt.)high Enthalpy, entropy by Body cooler only, power loss (Otto.)*
{release piston}, control Enthalpy degree, entropy by Air puffing & Body cooler more effective reaction on power (Shirwo S.).*

A summation of stresses will effect on the wheel. and on this a semi-opened position, stresses effect on these parts or near by will be less since the explosion of the air-fuel mix has already finished before in the chamber alone far from any valve. Same operation will be happened with the nearest wheel chamber (by angle radian distance) consecutively and so on the rotation movement will continue.

7. When the gases manage to escape with the rotation of the wheel, the chamber will reach at the end of the exhaust opening to the pure air puffing valve that opens due to the rotation and tapping of timing bar controlled by side pad against the chamber, to puff a fast pure air, cleaning (scavenging) the chamber from what left of the gases as exchanging operation (the emission by pure air) .To expel these gases before the chamber leaves the exhaust opening totally .This helps in ending the expected tacking due to the remaining carbon optical which may exist after burning the fuel mix .This way of cleaning the chamber by air has a great effect in deducing the pollution of un-oxidised gases. It is helping to treat them while still hot and will minimise the expected production of harmful premier oxide gases. The pressure of this air will exceed while rotation speed increase with adjustment to keep chamber always in a suitable temperature for engine situation by this new procedure .

**(suction stroke) piston to downward d. pt. high Enthalpy, stroke& power lost (Otto.)*
{natural stage – air puffing on chamber} control of Enthalpy no power loss (S. S.)*

8. Then the rotation continues for the next stage to be for the comparison :

**(compression stroke) piston to upward dead pt., Enthalpy, loss power, old S.
(feeding -charging zone) control of Enthalpy, no power lose, Shirwo engine.*

9. In increasing the speed of this system, the radian rotation velocity of the wheel would become near to equalise a speed of pistons push-arm depression's velocity

(resistance speed reaction), it is theoretical assumption depending on character data of this elastic push-arm, although the high speed will try to balance the wheel. This means the expanding spaces of chambers will be deduced (for the said engine power) by increasing certain speed, a mathematical criteria with fuel feeding rate: speed, resistant depress, dimensions, fuel and of course the loading on the engine will be concluded to reduce fuel feeding at increasing engine speed.

In high speed also, the reaction of the nature's centrifugal power will appear at combustion stage then power zone to act on piston(s) (and its chambers) consecutively as located almost in circumference of a rotating circle, free to be pushed outwardly, by this centrifugal potential opposite power (i.e. piston and combustion gases in the chamber, as mass reaction under Newton law), but due to gas pad in a locket chamber (after combustion happened), and existence of Case circular back wall (chamber back wall); that keeping the chamber in constant radian move maintaining the same constant pressure in the chamber (due to this design and seal places). This pressured gases as gas physical characteristic will reflect as a balloon any power effect on it as opposite reaction of piston to counter it back again on piston(s), then wheel(s) magnifying fuel combustion reaction on engine. It is meaning of reducing the expanding of chamber in highly speed for the said power, means reducing of engine fuel requirement for the said speed i.e. a criteria for reducing fuel consumption while increasing speed. (Fig 19/25).

The accessories which help this engine to work are:

As shown in (Fig. 21/25 & Fig. 22/25),

- A. Cylinder for compressed air, this cylinder should be in a suitable air pressure by the manufacturer before engine start to performance only, then it will be charged automatically by the engine via a compressor which gets its rotation power from the engine itself by a belt which keeps the air in sufficient pressure. It is to discharge air to the main pipe which guarded by a regulator controlled by accelerator-bar from driving cabin which is always in closed status when engine out of work, electrically. To be opened when ignition starting with the slowly-run (idle) regulator. A device control the pipes outlets one for (air-fuel mix) to get fuel spray for whole power wheel units. Or to a separated fuel spray system for each power wheel unit, by electric control (computer system) from the driver cabin. The other pipe for pure air to be puffed on piston and its chambers at end its exhaust.

- B. The fuel spray system is a mechanical and/or electrical device with a needle valve which uses a simple principle of permitting fast air passing on small outlet opening of fuel to produce spray in this air as required depending on Specific Density of fuel which maintains in supplied by usual fuel pump(mech. or elect.).
- C. The necessary pressured air will increase due to driver paddle-managing system controlling feeding then speed of engine's rotation and torque power.
- D. The other accessories like oil pump and water pump and ignition distributor will rotate with the crank or as for the industrial design.

The overall work of power wheel units (as all) output with a remarkable rotation speed monitoring the ideal output of this engine could be changed not only by depending on increasing fuel discharge-pressure, it could depend also on other engine modifications for separating engine's part performance as auto-output.

CONCLUSION :

The basic design technology of this engine shows a main legend which is to enable to employ the well known physical concepts, those which may inversely proportion with an available factor in any engine, that is the 'speed' to have them in particular combined physical criteria to be utilised for the benefit of the engine output. The design was plant in association to provide practical ways in highly speeds stages to reduce fuel consumption or to increase the power or acceleration by a said fuel. Also to be able to conduct the engine by independent controlling device to feed the engine (there is no relation with engine activity), although the engine could supply indirect power resource as to assist this device to work (i.e. by a conversion belt). Also it provides ability of independent conducting for each combustion intensity inside the engine without influencing on the others, even on services (oil, cooling). It introduces a unique way in conducting this engine which utilises legends of the physical concepts connected with the circular motion the of bodies, by using the Kinetic energies and its benefit to overcome the high rate lost of valuable fuel energy in all the present advanced automotive engines and finally in actual use of computer.

- 1- This engine depends on many elements constructing its performance, fundamental physical concepts of dynamics, elastic characteristic of material, the best way of utilising fuel combustion and the best workable mechanical sliding design, these elements are put to work in association to produce better fuel utility output.

- a- The cylinder(s) has flexible piston, mounted in each wheel on the centre-side of wheel axis with central line angle($>45^\circ$) on its wheel tangent i.e. larger than 45° , a certain force on piston will urge it to deform and transfer part of this force to the wheel then acting like sway pocket to rotate this wheel due to moment resultant.
 - b- The air-fuel mixture charged in pressured mode or in supercharging mode.
 - c- The mixture charge will explode by timing spark plug, nothing will prevent this.
 - d- The piston is placed in a plant position against the spark plug at ignition timing.
 - e- There is one wall in the chamber has ability to move if urged by a force, that is the piston, to start to depress guiding explosion charge impact to be driven on it.
 - f- The flexible piston in the cylinder is affixed by elastic compression push-arm (ductile spring) on cylinder base, any force impact or increasing it on this piston will cause the piston to depress to inner ward due to the elastic deflection of its elastic compression device connected with. It is by Hook's law of elasticity that means the displacement characteristic is proportional to its force in a straight linear mode. Part of this acting force on piston will transfer to the cylinder base via push-arm causing this wheel to rotate as has sliding periphery edges. This magnitude is in a plant design considering Modulus of Elasticity for push-arm.
 - g- The wheel will rotate sliding the chamber's emission contents to exhaust zone.
 - h- The principle used here is the same used for explosion concept inside a canon to through a bomb and how to re-fill automatic weapons rapidly by its emission's gases .
- The displacements of these pistons are in different magnitude depending on each explosion charge occurred in their chambers since each piston's elastic push-arm playing a major part in the performance of this system, that is to provide the actual spacing on chambers relatively to the actual required work to be done by the engine in order to reduce the fuel consumption to be according to the exact needs of work.
- Modulus of elasticity for each push-arm will play this major part in this system by using different magnitudes in each option even in one push-arm e.g. starting its top (beneath the piston directly) in sensitive elasticity to deflect under primer increase of a chamber pressure(the air-fuel mixture) at explosion to deform its piston to guide the primer impact to be directed then to drive the whole explosion impact at the piston(s).
- This is a similar to that old concept still used in fabricating cylindrical gun canons. The magnitude of modulus of elasticity for a push-arm may be changed gradually directed to the inner ward i.e. to cylinder base as plant, to increase the resistance in

a design connected with the whole engine features, by using different cross sections in ductile spring under pistons; to let more effective impact on cylinder base then to on the wheel(s) then producing moment (or as momentum) for rotation.

That is explained way the cylinders in this engine have more related lengths .

The pistons will work harmonically inside the engine due to their freely way of fixing them inside wheels with independent conducting feeding supply. This is regarding an important physical concept(a rotating object will need less power to keep on in its dynamic move or even if accelerating it than that primer power used first to change its static to dynamic mode as a relation proportioned inversely with its rotation speed)

This in considering all data, type of fuel, and situation of engine in various loads.

- 2- For the interrogation on how the aerodynamic effect is existing from exhaust gases by using specific outlet opening .

It is by applying that fundamental concept of (Bernoulli's principle) and escaping balloon concept as essentially used to produce aerodynamic force in any rocket !.

The chamber(s) in the wheel is to be assumed as a rocket's chamber that contains pressured gases emissions(from fuel burnt) to expel from a rocket back side via a designed outlet (opening). This would be guarded be wings to change diameter or the angler direction of this opening to effect on escaping gases to control speed or direction of this rocket(same control has been used in advanced fighter air-jet).

The same thing is applied (relatively) on graded specific exhaust openings fixed on the Case around the wheels periphery at starting exhaust portions of this engine.

That is to construct affixed wings (or moveable by control) on the Case periphery around the wheels at a starting of exhaust zone to inverse the aerodynamic effect.

These out lets which shaped by fixed wings will utilise the exhaust energy power.

Since chamber(s) in this rotating wheel is containing pressured gases due to previous explosion of air-fuel mixture (occurred before by spark) besides existence of Back Off force from the depressed (mode) elastic spring which is fixed beneath the piston to react, but in dual opposite directions ; on piston and cylinder base in the wheel to react also when chamber pressure starts to reduce at gas penetration.

The place of these openings in Case starting where exhaust gases are free to expel.

The openings orifices, angles, (wings shapes) and the places all will subjected to a plant aerodynamic design to act intensively at the exhaust zone outlets considering all other data e.g. the dimensions cylinder, the wheel, back off elastic springs , the

fuel mixture compression ratio with the whole engine design and its loading.

The chamber structure will be under escaping balloon concept same that used for a rocket; to be reflected then to act on its rotating wheel to add more power, more torque on engine output freely since the design provides this unique ability.

This explained how the aerodynamic force of the exhaust gases could be utilised to add more power over the conventional fuel combustion power on output directly.

The simplest example is a Rolling Fire Works Wheel rotates by reactions of lighting these Fire Works mounted on the wheel periphery and so by using this principle.

Exhaust central outlets placed to face the chambers and to be under the effect of aerodynamic exhaust gases when expelled from the chambers by a design starting (with rotating direction) by a small opening of sharp designed angle on its wheel tangent on the inner wall of wheel Case then followed by others in plant distances with gradually increasing in their diameter and/or in a tangent angle around the wheel periphery, in the beginning of exhaust zone; to have actual dual effect.

First, increasing the speed of expelled gases (via small holes) to produce reflecting aerodynamic force acting positively on wheel. While changing the direction effect during the wheel rotation by positions change of outlet holes and angles.

As to inverse a centrifugal turbine principle, when there is rotating periphery has plant wings surrounding its inner space with a pressured air comes via a pipe to be urged to drive outwardly in diagonal certain direction crossing these wings.

The fast air will act on these wings while discharging out ; aerodynamically forcing the wings to move rotating the whole periphery on the same direction !.

How about these wings are in affixed periphery as the Case of this engine, and the puffing device is able to rotate by a reaction , then it will rotate, same as the inner freely rotating wheel, containing chamber(s) of exhaust pressured gases urged to expel but aerodynamically to force the wheel to rotate.

How specific is this movement !? That is depending on how to exist and invest this phenomena in a design subjected to the whole mathematics calculation of the above mentioned data (by using computer formatting programmes !) .

- 3- The interrogation about the engine performance as combination of piston, rotary and turbine with additional influence of physical positive effect due to movement of elements inside the engine. This design includes fundamental physical concept those which used in inversely proportion with an available factor in any engine that is

the 'speed' to have some Kinetic energies acting in a particular combined physical criteria to be utilised for the benefit of the engine output depending on conducting way of this system.

By employing Newton's Laws of Motion, Gravitation and Centrifugal concepts to be implemented in this engine design same as used in astronomy's legends.

The piston and its chamber (actual piston cup mass) are placed in the open side of a cylinder in the wheel(s) near the circumference. This cylinder(s) is placed in a position to have an axis making a wide angle with its wheel tangent to let a use of centrifugal influence to employ its resultant effectively by choosing an angle larger than 45 degree. The piston(s) will be under the effect of combustion force rotating the wheel, in the same time at high speed to be assumed as an attraction force on the piston(s) which is moving in this circular zone of wheel(s) periphery directing to its central axis, while the elastic push- arm beneath piston(s) urging to push it outwardly by transferring the centrifugal effect of the wheel fast rotating on the objects placed on its circular zone. The rotation speed producing this centrifugal effect which is as known will proportion inversely with the opposite force as it is here the combustion force (attraction force to the inner zone) on piston(s) which is consecutively occurred in the chamber(s). The force of pressured emission will laterally reflect any force acting outwardly on its flexible piston according to the concept of how pressured balloon could reflect a force (by gas elasticity) back on the same direction i.e. on the piston again. But since each chamber(s) is mounted on centre side place of the wheel the final resultant will act on the wheel rotation by accessing additional moment on it. As the angle of the cylinder is considered.

That means also the actual expansion of chamber space will be deducted besides that concept of urging to balance the positions (as flexible) for all bodies which are mounted on opposite direction round a wheel in fast rotation, although there will be a certain force to keep the wheel in rotation but as minimum as required.

This means a deduction in said required internal combustion force in highly speeds or a rapid acceleration i.e. deduction in fuel consumption as if compared by the conventional systems.

How to use this combined physical criteria is by substituting relevant determined data of the engine design and specification of fuel used to built the mathematical equations to observe practically the certain magnitude rate of magnifying the fuel

energy on the output of the engine for a said fuel by physically utilising specific movements of elements inside this system as declared above.

However a perfect fuel power output occurs practically due to longer moment effect of pistons with wide torque effective angle on the crank(could be more than 180°).

Analysing the elements and the reactions :

After the instance of fuel combustion in this mechanical design and according to direct the powers occur simultaneously at fuel combustion in this discipline which employed natural physical concept powers to happen due to the particular places of chambers and by utilisation physical characteristic advantage of gases under pressure in chambers those result due to fuel combustion, reactions appeared as:

- A- The pressured gases impact on piston, the power reaction of elastic flexible push-arm, would act on two ways. A part pressing the wheel to rotate, and a part acts to get back to its previous mod at the piston top point (upward dead point), as it is elastic push-arm that will be stayed in charge beneath the piston, due to chamber's combustion gases. It is the gas physical characteristic in a closed space, which will resist any force as gas elastic resistance to reveres (reflect) this reaction appositely, which will be back again on piston and since the back side of chamber is the Case circular wall (internal circumference of circular case cavity), which provides away for keeping it rotating smoothly (on constant fixed axis), keeping chambers in locket situation by the radian seals job, while the wheel rotates means keeping a lock chamber in power zone with constant pressure. This means keeping the longer impact effect of this power on Crank. This is the hydraulic reactions of chamber gases inside this engine & the spherical shape advantage in utilising the chamber pressured gas pad characteristics in this situation by consecutively investing of all physical powers effects happen inside this system to be concentrated on the chambers to be used positively on engine.
- B- A losing of pressure due to gases penetration as gases start to penetrate when wheel chamber reaches the exhaust opening, will agitate the elastic strained piston push-arm (in static mode but depressed situation) attending to return back rapidly to its normal position, it reacts on two opposite directions (dual sides), meaning on wheel and chamber gases to add more power on wheel for torque..
- C- After the continuity of wheel movement and those powers effect, a new physical power happens after this instance due to the way of exhaust wings opening's

design. That allows the under-pressured gases to extend partially then totally penetrating in away to get their fast best position of escaping from chamber. With the advantage of existing access power from the piston push-arm resistant being under press that attend to return to its normal (first) position. A Physical power which is the Aerodynamic that forces the chamber to be at the right directed portion while gases escaping. Which will cause additional rotating power on the cylinder i.e. wheel to rotate depending on its place and on the exhaust opening place in this design. By the meaning of escaping balloon principle used here in this analysis. It produces aerodynamic power by using the effect of air speed concept (as flying concept put in a reverse way of reaction analysis).

D- In increasing of the engine speed (i.e. revolution speed) physical powers will appear, instantaneously at the time of combustion and increased consecutively, with influences on the piston (chambers) performance and will effect in two ways.

First , each piston which produces linear force to accelerate a revolution of a circular body (the wheel), which is mounted therein. This will be under a physical effect depending on speed factor, due to this design. The reaction force to accelerate the wheel revolution which is the linear depressing of the piston inside a wheel will be reduced linearly since it could move freely due to its push-arm. That is the more speed in revolution does not need the same primer impact of linear force reacting all the time to keep the wheel revolution in a constant high speed or to accelerate. This means a particular consecutive reduction in potential power of the piston (i.e. the fuel combustion needs) during highly speed, that will be required to produce these impact powers consecutively on wheel. This means the said fuel demand for highly speed situations of engine, could be reduced rapidly while reaching highly speeds and so on. This with other criteria concerning the distance of push-arm depressing formula against the combustion force. A relation to the wheel revolution speed and the decreasing of linear movement of the pistons while increasing this speed, which may reach to the minimum reciprocated linear force effect situation (minimum piston displacement) on the wheel in the highest speed . A physical concept implemented here on wheel's rotary dynamic speed and its acceleration and the linear (piston) force effect consecutively, to reduce these reactions due to speed effect in highly speed.

The other effect is by using the physical concept of how a space-ship is escaping from earth-gravity i.e. a technique which allows a space-ship fly free from Earth Gravity intensity zone by employing the centrifugal concept. This system employed this concept also inside the engine in a very small sample but in inversely reaction, by countering this force. The piston cup(piston top and gases mass in the chamber) is to be assumed as a mass with free movement under the effect of speedy circular circumference zone (as a space-ship and the wheel as earth while increasing its speed). The more speed, the more force to let these masses try to escape from its central gravity in consequence reactions, the under-pressure gases happened instantaneously after fuel combustion in chambers will counter these reactions since the pressured gases in a closed space (the chamber) will reflect this outwardly centrifugal effect reacted from the piston back again to the wheel via the piston face itself by the gas physical characteristic being under pressure in the chamber(s) in a closed space to act like a balloon for reflecting any reaction, back on wheel which is the only free to rotate more as pivoted on crank of engine, adding this additional power to act positively on wheel again. All these influences connected with the physical centrifugal concept employed here. Even the distribution of pistons in wheels and achieving the balanced positions of pistons at highly speed would be considered. These reactions appeared due to employing physical concepts related with the circular shapes of members used in the discipline of this system, the resultant would be called additional *spherical sustained* reaction on the engine (Fig 18/25).

The mathematics analysis for all mentioned concepts could be achieved easily. A computer formatting conclusions on calculations for a piston weight, a wheel diameter, type of piston push-arm resistance, fuel output, the design and kind of application, the reduced spaces at various speeds; in achieving the required dimensions for each option. The graphical indicator diagram analysing deduction of chamber expansion at various speeds and its exact fuel need for the smallest extent chamber space to be achieved then using advanced controlling system e.g. a computer to observe these potential effects with relation to each options to connect with a feeding device to reduce actual fuel consumption at highly speeds. These potential effects are still neglected and lost in the conventional systems.

But here is the practical advanced way of reducing the fuel consumption in highly speeds by using physical criteria in such designed power system to use it !.

IN GLOSSARY (Philosophy of utilising Physical Centrifugal technique) (Fig 18/25):

This system is utilising a theory, which used in charging water or air e.g. any liquid by a concept of a "Centrifugal Pump or centrifugal compressor" rotates by automotive power resource supplied from outside.

Using the same theory for this design but in a counter way of reaction. Since the liquid used here inside is replaced by a specific one containing potential energy, an easily analysed chemical energy liquid, that is the air-fuel mixture. Which is being used first in this discipline, to produce chemical energy force inside this system to use it for supplying system automotive power requirement. By making this energy acts in a way to make it rotates by an inside automotive power source. Then using the physical reactions appeared in this discipline which is similar to centrifugal pump, due to speed reactions on a mass located on a circular zone, to act on pistons-cup i.e. (mass of piston and combustion emission of expanded gases in chambers), which seated to be under this influence freely to be effected to be driven outwardly consecutively in the meaning of reducing the linear displacement of piston due to fuel combustion without losing its impact on the wheel, as relatively to their particular place on circular zone in this system. This influence will react in a reverse direction in this discipline due to emission of pressured gas pad in chambers to act as elastic resistance as a balloon of gas in the chambers upon pistons to counter this influence to act back again on pistons which are already pushing their wheel(s) to rotate to be as physical additional resultant acting positively on pistons, i.e. engine consecutively at highly speeds. In the meaning of using this new principle of centrifugal concept employed in automotive power discipline for the benefit of increasing engine output by using the reflection of inside centrifugal reaction, to use these as a criteria to increase output power of a said fuel or to increase acceleration rapidly or to reduce the said consumption in this integral engine system.

These invisible(or indirect) physical influenced reactions in additional to the exhaust physical aerodynamic effecting on combustion intensities are due to advantages of circular shape body rotation and its physical utilisation in this system so it would called (*The spherical sustained reactions*).

SPECIFIC PROPOSALS :

1. Light solid alloys for power wheel unit might be reinforced by a hard solid alloy in high torque stress places (i.e. crank-wheel hole, middle panel of wheel between the cylinders, cylinder bases and modified wheel anti-scratch circumference).
2. Light solid alloys for the piston's disk as the specific industrial requirements.
3. The push-arm elastic compression resistance capability for piston must depend on type of : engine output, acceleration, speed, application, type of design, fuel...etc. The flexible elastic system may be as metal spring or hydraulic elastic compression system could be used (i.e. of gas or oil) with the heat resistant seals i.e. that used in weapon industries as for automatic fast canon refill system. The compression metal spring could be in differential cross section diameter as to start small from the top then increases within a plant design to let it bears the various stages for different power ranges, same goes to the shape design of the ductile spring
4. For radian gas seal mass: could use a self-lubricated Graphite(carbon) alloy or hard specific metal alloy with special lubrication system in the engine case using the advantage of one direction wheel rotation with special trenches and holes. Or specific plastic solid compound material with anti-heat characteristic, the type, shapes and sizes might be varied from different industrial resources, for minimum sufficient contact. Three types of seal mass, for anti air penetration, Or use couple of seals for two-way effect i.e. opposite lock reaction in one seal mass unit. Wangle seal could be used in each seal mass unit i.e. not in rotary part here but in the case that provides more efficiency and workability since they will be used in a fixed place acting on a fixed axis maintaining a constant axial positions for contacting wheel circumference surfaces which fixed on one constant axis in this system (not parabolic rotation !).
5. The big circular seals between Case and wheel for sliding and anti-penetration, are of couple three or more stainless steel ring bladder inter-lock gathered as a slide bearing ring device or as industrial required. Or by special wheel's edges with sharp design to inter lock with engine Case ,a specific technique as required to reserve the mod on wheel depending on design proposals . (Fig 2/25 & 3/25).
6. Oil, gas, ring seals in pistons are by using the specified required alloys.
7. The oil pads are of light aluminium circular plate alloy with special radius grooves for oil cooling with smooth hard specified alloy edge for controlling timing of valves-

bars with chambers positions, the timing control for the two valves in one pad or each in a pad, the timing depends on the design data and other requirements.

8. Oil is used for lubrication & cooling the power wheel units, this oil could be cooled by water or air cooling sub-system in the engine case or out side the engine.
9. The distributions of oil and cooling water grooves in the Case are as for industrial design of the Case to cool the engine returning oil in the Case and the engine.

USEFUL INDUSTRIAL & COMMERCIAL CHARACTERISTICS :

1. A simple easy to manufacture and less components parts for the final products.
2. High output related to the size and cost, a system contains pistons with rotary operating using the exhaust aerodynamic and other potential power advantages.
3. Using a new principle in charging the air-fuel mixture to the chambers, i.e. pre-compressed air-fuel mixture, from out side with any pressure needed for the required performance, not as the old principles which sucking the air-fuel mixture to the chamber and compressing it to be in pressured situation by the same piston with its way of losing power stroke and energy and relative slow acceleration . This means using of a jet technique in charging fuel, in this design which will give high performance as fast and better fuel burning as fast acceleration engine needs without limits related to other specifications.
4. The pistons in this engine connected with a relevant free flexible push-arm working as elastic resistance, using various resistant types depending on the engine design and power data occurs in the chamber at firing stroke, (types depending on fuel and design). This characteristic will apply good specifications, one of them is in reducing the sudden impact and will uniform stress of high power if occur on any piston(s). In away that these push-arms will transfer stresses of pistons uniformly on the Crank i.e. making the engine more smooth, reducing the vibration. The elastic flexible piston depressing will allow a good flame propagation (as combustion chamber space is automatically controlled), and the same reason to prevent detonation in chambers.

The heat energy advantage (if used) would tight the flexible push-arm of pistons with heat increase especially in using a gas or hydraulic resistance, which could reduce the elastic movement of pistons (increase the resistance). It means reducing the sufficient capacity of charging air-fuel mix for the same output later

with the continue of working time. This special design will agitate (at fuel combustion) these physical nature's powers to appear in a situation could magnify fuel output to be in the best potential power related with speed in this engine.

5. The main oil services depends on a natural constant principal with a special design that the oil flow will increase with the speed increase naturally not mechanically (as for conventional engines). This will be done by a centrifugal concept depending on the pads designed groove by feeding from central tunnel in Crank via relevant holes with relation to its distance from oil tank in engine. Magnified with speed increase, cooling the wheels and disposing pistons oil. This characteristic will lead to use the far pad in crank as huge oil pump by using high hydraulic specific grooves(trenches), for sucking oil from Crank to supply oil in Case for those seal masses needs and to cool Case in a best way. The usual oil pump could be cancelled if the oil tunnels in the case terminate at feeding (middle) oil tank of the central canal. The central canal in crank would not effect on the actual moment of inertia of the crank as its cross section is always circular.
6. The pistons with their free flexible arms will reduce the reciprocated movement to minimise it decreasingly (the distance between upper and lower piston's dead points); due to increasing of engine speed, in this design. This matter reduces displacements of main engine parts (pistons) movement while increasing speed, (not in constant displacement at high speed as in conventional system!) by implementing physical concept related to a spherical rotating in speed and accelerating by reaction of linear forces effects on it. The reduction of push-arm depressing distance with wheel speed increasing due to engine speed would lead to theoretical assumption of a minimum movement in the very fast speed. It is a physical criteria of the consecutive reducing in chamber's expanding space for fuel at explosion and the way of this characteristic transferred by the same emission gases in chambers to reverse it to act positively on engine output.

It is one of Mighty God miracles in creating the very huge Space Universe and the little knowledge of man on that , one of what's concerning the spherical shape bodies, that is the centrifugal concept , man is trying to use this concept in reducing (said)fuel consumption in his very little engine, while increasing speed, as the most pioneer characteristic to be utilised by using advanced accessories.

7. This engine system does not contain those valves that used in the old engines with their timing articulated connecting system, (camshaft, gear, pinion.. etc.) Those things are not existing in this system i.e. cancelling their weight, noises and expected air smoke related with any of their defect also cancelling their problems of failure that may happen in high speed.
8. The air-fuel mixture quality can be controlled easily in this engine from out side accessories, in two ways by controlling the supplying pressure and also by controlling the fuel mixture, or both together depending on design data, however the system may not require a same(ideal) uniform fuel compression ratio in all its chambers or in all of its working stages, since independent pistons performance characteristic with their ability of various displacements providing flexibility in the engine to make this system easily uses different types of fuel efficiency, any gasoline(Benzene)octane, or Jet gasoline or even Gas fuel could be used after reconsidering the mixture accessories requirements for charging these fuel.
9. Cooling chambers and expelling exhaust gases out of it by puffing air (scavenging) directly on it at the end of exhaust stroke. This will control the heat of piston cup and supplying perfect adiabatic efficiency of air cooling technology for pistons in addition to the wheel side-walls oil cooling & enthalpy of cylinder walls. The air also will prevent the remaining of after burning carbon (soot) and will complete to oxidise unburned carbon oxide gases i.e. (CO) directly to (CO₂) or (H₂O), same to complete oxidation for the sensitive nitrite oxides (NO_x), (and SO -if exist). This a practical way for anti-pollution treatment technology inside engine, in a way to help conserving the environment and to prevent occurrence of harmful acid rain in industrial territories, all these missions could be under a perfect control. When there is no sufficient time to complete expelling exhaust gases of a chamber* in a highly speed, it is possible to make this mission repeated for each twice revolution of this chamber, by having a management(as this system permits for that) to make the fuel feeding for it* to be for each double revolutions consequently & harmonically .
10. There is a perfect way in lubricating the pistons that only the moving one will be lubricated when it needs to. Each piston has it's own private oil pump, and the lubrication system designed in away to reduce too much the pollution of air-oil smoke, since no crank case-oil sump bellow the pistons, however a leakage gas affliction will not cause oil smoke as much as old system does; if this happen.

There would be an air pad(s) under the piston(s) that could use its advantage in a special piston design to maintain a sufficient pressure in high temperature beneath piston to use it to be utilised ...for longer seals maintenance period and for output. This way could be connected for dual piston effect in one wheel.

11. The distribution of piston (cylinder) angles in the central crank in the engine will not need a balance weight These are not required in this engine system. The way of emission gases exhaust rapidly with the circular rotation's direction will minimise the stress on stroke final seal masses and helping a good lubrication mission for all seals.
12. This is a specific design in distributing pistons with its unique way of piston free movements while rotating the Crank (torque crank shaft). The principle used here will not need to distribute the stress for every combustion (piston) unit, as for old regular engines in all working time. That happened in the old system which all connected with a zeg-zag crank shaft; each one with its special angle in slipping point guarded with metal bearing pads. Meaning all the combustion pistons will move consecutively (mutual) side by side equal, in the cylinders due to the rotation of the crank shaft, all the time, this increase with speed acceleration causing more friction, heat and vibrations, more lubrication need, which all affect on the engine efficiency. This new system is not working on that old principal, it reduces piston(s) movement in a counter way with the increasing of speed, due to physical concept implemented on this discipline, to reduce speed effects on engine, even it can reduce the fuel consumption in highly speed using advanced controller systems depending on the criteria of rotary wheels and their pistons harmonic linear movement and its performance on certain speeds & applications.
13. The best seen characteristic for this engine is the multi-output powers which can be changed in various ranges not as by depending on the revolution speeds of the engine but on the required movement of the working pistons inside the engine (automatic power parts output). Like for example all piston in used supplying 100% output of the engine for heavy work in vehicle engine(4x4 wheel in work), or 2/3 or less parts in used for high speed or 1/3 or less parts in used for just to keep the engine in Idle working situation. This could be done in away that even its oil services could be stopped by controlling their relevant pads centrifugal outlets. This characteristic is very useful: in reducing actual fuel consumption, reducing pollution & providing longer maintenance. This new engine can be produced as

engine for every work (as multi-purposes) in one equipment(i.e. one vehicle) which is automatically suits various ranges of outputs requirements, without effecting on unused parts or causes tough vibration,(i.e. automatic output engine) as for different requirements for Hours Powers e.g. excellent use for 4x4/ AWD.

SHIRWO + Automatic Need auto engine will be called (SHIRWAN) SYSTEM {S.H..I.R.W. Automatic Need = SHIRWAN for automatic-power-output engine }.

The heavy transmission gear complex in this engine could be minimised or even terminated but of course keeping the reverse position available .

14. Since there is the ability of stopping piston's movement in this design while crank continues in its rotation plus the circular slice machinery. The engine could be combined with an electric power engine mounted on the same crank or by clutch as advanced engine design with very practical use, it is a fuel combustion engine with electric power engine in one unit set . Depending on the simplicity of this design which can charge an electric battery when the combustion engine working. The electric power engine could be used directly instead – if it will be required when a situation needs i.e. a crowded city, to reduce the pollution. This is a piston - electric output (combustion - electric) in one combined engine unit.
15. In addition to other characteristics, proposals and options which can be obtained in industrial laboratories this machine will fill the gap between the normal piston combustion engine, and the turbine Jet engine using their-all-good characteristics together in one engine unite, it will use the good characteristics of combustion piston (and rotary) engine in economic fuel consumption, slow rotation speed if required, small engine and easy to manufacture and maintenance, with the Jet characteristics of high power, high accelerated speed if required also by using the aerodynamic power of exhaust gases with other physical potential powers; all in this integral design and cheap engine.
16. This design will open the wide gate for the computer participation in controlling all engine activities and its characteristics performance by using advanced controlling accessories with economic industrial influence in the age of computer.
17. This engine could work in a vertical direction engine related to the torque crank since most of engine oil services depend on centrifugal concept related on speed. Its important characteristics and the ways of reducing(decreasing) fuel consumption rapidly with high speed increase, this will lead to use it mainly in

high speed equipment that needs less reciprocating piston movements which makes it very qualified engines for Hoover Craft or flying equipment.

More advanced research on it will continue, for example computer formatting ready programs and the use of advanced Laser ignition could be used .

18. The variety of design options on this system could be implied easily since the main elastic parts of this system could be used from the variety of elastic devices springs or hydraulics used in the automatic re-fill emission weapons, those various machine-guns, the fast-cannons, i.e. those weapons industries could participate practically indeed by a good part of their products in supplying main parts of these engines, to start changing those industries for man's civil and peace purposes ! .

DESIGN PROPOSALS AND OTHER OPTIONS :

1. This engine could contain many power wheel units depending on the out put torque power, with a relation to the diameter and number of cylinders in each wheel, the various proposals and options of this system provide extensive use .
2. The power wheel units could be in different diameters for kinds of engines, the principle of piston's moment effect on the Crank will be considered in related to output power using the required wheel and cylinder diameter in any engine design as these are some engine options. (Fig 2/25)
3. Double ignition systems (accessories) in one large (super) power wheel unite, one or more in an engine, could be used as some engine options. (Fig 24/25)
4. The main canal(tunnel) for oil supply in the crank could be seated out side the crank. A longitudinal tunnel connected parts on the crank as a canal across all parts (that stickmen together), parallel to the crank line as its boundary, with holes for each part, for oil feeding, considering the main intake and parts balance. The oil supplied for radian seals by specific tunnels in the case via modified pad.
5. The water could be used for cooling power wheel units by a specific design for Case with more extensions between the wheel units containing canals for water, or using air cooling system ,as these are some options .
6. The difference of cylinder number in a wheel depends on the diameter and speedy output power of the engine as these are some options, (Fig 14/25, 24/25).

7. The cylinders in each power wheel unit in the same engine could be in various diameters as a specific in each wheel with relevant accessories as required for Automatic power engine, as options of Auto-Engine, (Fig 15/25).
8. The fuel spray system can be in one set for all air-fuel mix by a pre-mixed fuel feeding the valves, or could be separated pipes control for each power wheel units in the engine, controlled by advanced computer system, as required for Auto-power engine .They could be substituted by a direct fuel mixture injection on each chamber by additional Case fixed device for each wheel. (Fig 21/25, 22/25).
9. The fuel spray system could be controlled by a computer system to monitor the required spray mixture with air and could vary this mix for each type of gasoline octane by automatic device as required for multi -purpose Auto-Engine .
10. The use of different wheel data in one engine; with specific relevant accessories as required with automatic control for varieties in output range . This is the automatic multiple power engine, Automatic Engine (i.e. Shirwan engine).
11. The places and numbers of the radian Case seals can be changed depending on the design data and type of application depending on the industrial production.
12. The exhaust opening could be in different grade openings and angles related to engine design and fuel criteria and could be in mechanically changeable design for wings grades and directions by a mechanical device control.
The exhaust opening could be in opposite direction depending on Case design.
13. The flexible (elastic) system of piston push-arms could be in various types for different engine design (or even with differential diameter along one spring) using metal spring, gas or oil hydraulic device - heat resistance - like those used in automatic gun weapons, it might be more tight and qualified by heat increase !.
14. An advanced new modified system under the name of (connected hydraulic wheel unite system) could be used, that can get use of the impact power on a piston at firing stroke instantaneously to transfer a part of this power to effect on the opposite direction piston in the same wheel at a position when its combustion gases (of the previous piston) start to expel from exhaust opening. In a way to supply impact force from inside the cylinder to push piston outwardly faster for rapid expelling of those gases out of the chamber. Accelerating them to be released faster from the aerodynamic graded opening, producing more reaction on the opposite direction on the wheel increasing the turbine power. This is a technique of a connecting hydraulic system of two pistons. It could be working

- also between the spaces beneath pistons in one wheel. It is advanced modified option to be as a part of the development researches on this system. (Fig 12/25).
15. The central oil canal in the crank would not effect on the moment of inertia of circular cross section crank, as this depends on the size, diameter and metal capability of torque resistance of Crank related to its canal diameter. The usual oil pump could be cancelled in a design that could make oil tunnels in Case driving oil to the middle oil feeder tank that feeding central oil tunnel in the engine crank.
 16. The mechanical ignitions distribution could be in advanced electric device. It might need also additional timing device as for old system but with more simple method, and even could use clever computerised device or (Laser) due to the fast rotation of the engine as a part of advanced developments on this system.
 17. The metal industry for alloys, the grooves and tunnels could be easily done with the facilities of metal casting, and drillings available in recent manufacturers.
 18. This engine could be designed in a vertical crank(shaft) direction on the same system principal. It is because of most oil services are depending on the centrifugal energy which could work in any direction, the engine oil pump could be cancelled. This means it could be easily used for flying equipment or Hoover craft regarding the simplicity, the speedy efficiency, the output power and the small size. this promising generation of clever engines could be used for advanced small Hoover craft (or a composite vehicle as Automobile and Hoover Craft or running and flying transportation equipment) by implying this cheap system with using of recent available advanced computer control, (Fig. 23/25).

Note :

1./ Since this is a complete new system, the inventor tried to use the simple English words, with some names of components used in conventional engines, however these names (as specified) are not necessarily to be the actual standard names of these parts, they may change according to the developments.

2./ All the prescriptions and declarations are for the enclosure 25 drawings which are the references that declare all the compositions typically, done by Auto-cad drawing program A2 (Drawings details are the reliable references before words).

THE DRAWINGS CONTENTS

Important note: The drawings were in colour typical assumed dimensions using A2 paper size done by Auto-cad program to declare the compositions of engine. They are now (here) in scale for A4 and in black & white in the enclosure set of drawings as required, also they are not in scale for actual industrial use.

FIG No (Drawing. No).

- 1/25 (1) : GENERAL SHAPE**
- 2/25 (2) : TYPICAL POWER WHEEL UNIT IN HORIZONTAL SECTION.**
- 3/25 (3) : TYPICAL POWER WHEEL UNIT IN VERTICAL SECTION.**
- 4/25 (4) : TYPICAL SPRING MODIFIED CROSS SECTION.**
- 5/25 (5) : TYPICAL THREE-POWER WHEEL UNITS SECTION PLAN**
- 6/25 (6) : TYPICAL POWER WHEEL UNIT OIL CANALS , ANALYSIS**
- 7/25 (7) : TYPICAL COOLING, LUBRICATION PAD**
- 8/25 (8) : TYPICAL PISTON ANALYSIS**
- 9/25 (9) : TYPICAL ENGINE PARTS**
- 10/25 (10): TYPICAL DIMENSION OF POWER WHEEL UNIT**
- 11/25 (11): PISTON PUSH-ARM _MODIFICATION**
- 12/25 (12): DUAL CONNECTED PUSH-ARM OF PISTONS**
- 13/25 (13): VARIOUS PROPOSALS**
- 14/25 (14): VARIOUS CYLINDERS IN A WHEEL**
- 15/25.(15): VARIOUS PISTONS DIAMETERS IN ENGINE**
- 16/25 (16): VARIOUS WHEELS DIAMETRES IN ENGINE**
- 17/25 (17): FOUR-POWER WHEEL UNITS IN ENGINE**
- 18/25 (18): FORCES ANALYSIS IN THE ENGINE**
- 19/25 (19): TYPICAL ENGINE PERFORMANCE**
- 20/25 (20): A PROPOSAL FOR SEAL-MASS DESIGN**
- 21/25 (21): TYPICAL ENGINE ACCESSORIES, PROPOSAL 1**
- 22/25 (22): TYPICAL ENGINE ACCESSORIES, PROPOSAL 2**
- 23/25 (23):A TYPICAL ENGINE FOR FLYING EQT- VERTICAL CRANK SHAFT**
- 24/25 (24): A TYPICAL ENGINE FOR A WIDE WHEEL**
- 25/25 (25): ALL DETAILS OF THE ENGINE UNIT**

DRAWINGS DETAILS - DECLARATIONS...(IN ALL THE DRAWINGS)

1. **Chamber (combustion room).**
2. **Case (engine Chassis).**
3. **Wheel (Power wheel unite).**
4. **Wheel modified circumference (scratch resistant alloy).**
5. **Metal spring (straight or inclined).**
6. **Crank (torque-crankshaft).**
7. **Piston push-arm (flexible shaft device).**
8. **Piston push-arm base. (cylinder base).**
9. **Spark plug.**
10. **Piston oil pump (built in with push-arm).**
11. **Oil tunnel (canal) for piston oil feeder.**
12. **Bolts for fixing seal base (in Case).**
13. **Pinion, gear ring to transfer rotation to other device (for ignition).**
14. **Solid steel ring for piston lock (in cylinder).**
15. **Canal for oil service.**
16. **Regulator adjustment for big seal mass.**
17. **Pad for oil cooling & lubrication.**
18. **Ring seals in the piston.**
19. **Big seal mass in Case (anti-gas).**
20. **Air-fuel mixture charging device (pre-compressed mix. feeding).**
21. **Air charging for exhaust stroke (on chamber).**
22. **Valve for air pipe(mechanical- control). / (22d - oil check valve).**
23. **Canal for water cooling service in Case.**
24. **Central canal for oil supply - in Crank**
25. **Engine base flexible holder.**
26. **Big circular sliding seal in Case-wheel (anti-gas, anti-oil).**
27. **Ball bearing device.**
28. **Oil usual pump (for engine).**
29. **Water pump.**
30. **Exhaust aerodynamic specific opening.**

31. Cladding perforated hollow pipe(for piston oil pump).
32. Case main assembling bolts
33. Ignition distributor.
34. Middle oil tank (feeding tank for central oil canal).
35. Oil main tank (the engine oil sump).
36. Oil pump intake.
37. Oil supply pipe.
38. Oil refill opening / (for atmospheric pressure equaliser-ventilation).
39. Oil lock washer.
40. Tightening ring (washer with pin).
41. Cylinder for piston in the wheel.
42. Piston in the wheel.

The following is Abstract then 30 claims which are seated in simple language to obtain the new technical features and its industrial and commercial advantages provided by each claim on this engine and/or options in using SHIRWO System .

THIS ENGINE IN SUMMARY

SHIRWO S. :(Spherically-Sustained-Sliding / Harmonic-Hydraulic / Independent I. C. Intensities / Rotary - Reflected Reactions / Wheels / Operating_) System, is an internal Petrol combustion spark engine composing types of the recent known combustion principles (those separately used in automotive power) i.e. the piston, rotary and turbine, to perform all together in a compound system unit designed in integral sliding mechanism to achieve the best way in transferring fuel potential combustion energy to automotive power, with minimum power lost inside this engine which has flexibility to bear different ranges of combustion power intensities to be controlled to perform uniformly or independently but in harmonic effect inside the engine, using pre-compressed air-fuel mixture to be boosted to the engine, moreover this design is employing physical dynamics effects due to elements movement inside which appear at engine's work, to be utilised positively instead of losing them as a lost energy inside the engine, by employing techniques of using Nature Physical dynamic concepts to be implemented on these elements to utilise their effects for the benefit of engine output, to make this system depending on fuel potential chemical energy for internal combustion in addition to inside positive consequence physical effects to produce its final improved output, a system consisting many theories act in association to provide best fuel utility in producing automotive output power related to power-weight ratio, in the meaning of reducing said fuel consumption, this engine (Fig 25/25) comprising from a cylindrical Case 2 having one or many wheels 3, mounted and geared on a straight central (crank)shaft 6 inside the cylindrical cavity of Case 2 for rotation coaxial therein, the said wheel(s) containing at least one cylinder(of piston) 41 in centre-side perpendicular to crank axis, its central line makes angle on wheel tangent more than 45 degree as_its one side opened outwardly upon wheel rotating direction facing cavity of Case 2, a piston 42 mounted inside the cylinder which has the ability of linear movement therein. the piston 42 top together with the cylinder 41 wall (bore) and inner circumference surface of the Case 2 defining a combustion chamber 1, the piston 42 is mounted to the other closed end of the cylinder 41 via a free flexible elastic push-arm 7, circular seals mounted with the Case 2 around the wheel 3 along its circumference 4 on each side edge 26, to isolate wheel performance as well as three or more of seal mass

19 in radial location on the wheel circumference 4 width at designed distances to guard the mod of stroke situation zone in the wheel 3 during the work of the engine, the wheel(s) 3 conducted separately, by fuel mixture inlet(s) 20 via valve(s) 22, spark plug(s) 9, exhaust pipe(s) 30 and air supply inlet(s) 21 via valve(s) 22 mounted all in Case 2 around the wheel 3 the pre-compressed air-fuel mixture boosted (fed) into the chamber(s) 1 from outside by a valve 21 away from firing stroke zone, air is puffed at end of each exhaust stroke, all by using same main accessories (cylinder to store pressured air with recharging compressor, pipes, and spark distributor adapted with the Crank), fuel sprayed for air-fuel mixture by a device 20 before feeding as pressured mixture to be controlled from out side, exhausted gases are expelled via a specific opening 30 mounted in the case, valves 21, 22 opened mechanically in the right time against chamber(s) 1, controlled by edge of circular metal pad(s) 17, two metal pads 17 used for oil and cooling services around and coincide with (each) wheel 3 working by centrifugal concept contain radius grooves fed with oil from central oil canal 24 by sucking oil from the main central canal 24 inside crank-shaft length via holes then discharge it to outsider case to supply seals with oil, piston-wall oil servicing is by using a rod pump 10 mounted in its push-arm 7 connecting piston oil network with crank 6 oil intake 11, working relative to piston's movement, sucking oil from the central oil canal 24 feeding piston 42 wall contacting the cylinder 41, then to be driven to the a pad 17 at the wheel side-wall, the pads 17 collecting the returning oil from piston(s) 42 in wheels 3 to the outsider case 2, oil is cooled in the Case 2 while flows back to the main oil tank 35 on an end of Case which has specific air opening for pressure equaliser and ventilation for centrifugal requirements, the central oil canal 24 in crank 6 supplied with oil from middle oil tank 34 which kept filled with oil by usual oil pump 36 from main oil tank 35, where more than one wheel are inside the case each wheel could work separately with its independent fuel and air feeding devises controlled from out side, when the engine rotates, chamber(s) will be charged with compressed air-fuel mixture, then reaches firing zone, then it sparks by a plug, then its mixture explosion occurs then pressured gases at power zone, start pushing the piston, making the piston static elastic push-arm dynamically charged to a depressed situation, while pushing the wheel to rotate, the pressured gases exist in the chamber will stay in standard high

pressure while kept in closed space of chamber that surrounded by seals from all sides (with radian seals contacting wheel circumference keep on sliding on it) at power zone, while rotating the wheel, using gas characteristic in closed space like a balloon to reflect piston elastic upward reaction (to return to its first static position) by chamber(s) gases hydraulic reaction to countering this force to the piston again then to the cylinder base e.g. wheel keeping the same power of a constant moment on crank along power zone keeping on pushing the wheel to rotate, when the chamber crossing last exhaust gas seal, these pressured combustion gases in the chamber will start to penetrate as exhaust gases, but from designed exhaust opening with directed wings in specific angles to provide effective aerodynamic energy power effected back again on wheel via chamber(s) which is under this effect according to escaping balloon concept with more pressure forced from piston by the release of its charged elastic push-arm beneath it, making this aerodynamic force working faster and more effective in adding additional positive power on the wheel as a turbine principle on wheel(s) as a positive effect of exhaust stroke, to be added on power zone, these missions will be followed on others chambers, pure air is puffed to each chamber at end of each exhaust stroke to expel exhaust gases from chambers, to reduce heat of chambers and to treat pollutant of these gases while still hot, as a built-in technology for treating emission pollution, this system has the pioneer characteristic of (independent intensities) as independent pistons performance, this engine has the ability of practical reduction for fuel consumption by controlling work of combustion intensity (unit or group) separately for the required application, its design is seated to use the principle of reducing the distances of reciprocated movements of pistons while increasing the engine speed by utilising physical concepts depending on speed factor in relation with centrifugal concept inside the engine to counter fuel consumption at highly speed, the final output presenting the compound performance of this system which is suitable for the computer age by its activities formatting control, its wide options based on the fact that it could utilise those various products of automatic refill-devices of canons or machine guns weapons for use as elastic push-arms inside these engines to provide the participation for weapons industries in fabricating this generation of clever compact power engines.(SHIRWO SYSTEM) is the name of this system and (SHIRWAN SYSTEM) is for Automatic output system.

ABSTRACT(Pt. 2nd Ed.)

An engine comprising a cylindrical Case 2 having a wheel 3 or more, mounted and geared on a straight central (crank)shaft 6 inside a cylindrical cavity of Case 2 for rotation coaxial therein, the wheel(s) contains one cylinder 41 or more in centre-side in perpendicular plan to crank axis, its central line makes angle on wheel tangent more than 45 degree, has one side opened on outwardly wheel circumference facing cavity wall of Case 2, a piston 42 mounted inside the cylinder has the ability of linear movement therein, top of piston 42 together with wall of cylinder 41 (bore) and inner surface part of Case 2 defining a combustion chamber 1, the piston 42 is mounted to other closed end of its cylinder 41 via a free flexible elastic push-arm 7 has sliding rod device, circular seals 26 fixed around each side edge of wheel 3 on its circumference 4 adapted with the Case 2, to isolate wheel performance, as three or more of seal mass 19 in radial location on the wheel circumference 4 width at designed distances to guard stroke modes of each chamber 1 in which conducted consecutively in rotating by air-fuel mixture inlet(s) 20 via valve(s) 22, spark plug(s) 9, exhaust pipe(s) 30 and air puffing inlet(s) 21 at end of each exhaust stroke mounted all in Case 2, pre-compressed air-fuel mixture boosted or injected (fed) into the chamber(s) 1 and air puffed on chamber in exhaust zone from outside by using main accessories for air feeding (cylinder to store pressured air charging by compressor, pipes, and spark distributor adapted with the Crank), fuel sprayed into pressured air to arrange mixture by a device 20 before feeding chambers under control, exhausted gases expel via specific aerodynamic opening 30 mounted in the case, valves 21, 22 opened mechanically in timing against chamber(s) 1, by edge of circular metal pad(s) 17, two pad used for oil and cooling services coincide around (each) wheel 3 contain radius grooves to be fed with oil from central oil canal 24 by centrifugal concept in sucking oil to supply other seals, piston servicing of oil via rod pump 10 mounted in piston sliding push-arm 7 working by its movement, linking piston oil network with crank 6 via wheel oil intake on the crank, oil is cooled while flows back to main oil tank 35 with atmosphere opening, central oil canal 24 is supplied with oil from middle oil tank 34 which kept filled by oil from main oil tank 35, wherein many wheels are inside Case each wheel could work separately by its independent fuel mixture and air feeding devices to be controlled automatically.

THE CLAIMS ON THIS INVENTION : SHIRWO S. (Pt. 2nd Ed.. PCT/IB 99/ 00178 -USP)
30 claims (Ref. to the drawings Fig 1/25 to Fig 25/25 and the prescriptions)

- 1- An engine comprising a cylindrical Case having a wheel or more, mounted and geared on a straight central (crank)shaft inside a cylindrical cavity of Case for rotation coaxial therein, the wheel(s) contains one cylinder or more in centre-side in perpendicular plan to crank axis, has one side opened on outwardly wheel circumference facing cavity wall of Case a piston mounted inside the cylinder has the ability of linear movement therein, top of piston together with wall of cylinder (bore) and inner surface part of Case defining a combustion chamber the piston is mounted to other closed end of its cylinder via a free flexible elastic push-arm has sliding rod device, circular seals fixed around each side edge of wheel on its circumference adapted with the Case , to isolate wheel performance , as three or more of seal mass in radial location on the wheel circumference width at designed distances to guard stroke modes of each chamber in which conducted consecutively in rotating by air-fuel mixture inlet(s) via valve(s), spark plug(s) , exhaust pipe(s) and air puffing inlet(s) at end of each exhaust stroke mounted all in Case , pre-compressed air-fuel mixture boosted or injected (fed) into the chamber(s) and air puffed on chamber in exhaust zone from outside by using main accessories for air feeding (cylinder to store pressured air charging by compressor, pipes, and spark distributor adapted with the Crank),fuel sprayed into pressured air to arrange mixture by a device before feeding chambers under control, exhausted gases expel via specific aerodynamic opening mounted in the case, the valves opened mechanically in timing against chamber(s), by edge of circular metal pad(s), two pad used for oil and cooling services coincide around (each) wheel contain radius grooves to be fed with oil from central oil canal by centrifugal concept in sucking oil to supply other seals, piston servicing of oil via rod pump mounted in piston sliding push-arm device working by its movement, linking piston oil network with crank via wheel oil intake on the crank, oil is cooled while flows back on Case to main oil tank which has atmosphere opening, central oil canal is being supplied with oil from middle oil tank which kept filled by oil from main oil tank by oil pump, wherein more than one wheel are inside the case each wheel has ability of independent performance.

2. The engine characterised as in claim 1, has a discipline composing piston, rotor and turbine principles, to perform all together in a compound system unit designed in smooth simple mechanism to provide best utility for fuel combustion potential energy to be transferred to automotive power output .
3. The engine characterised as in claims 1, the said engine is using the new technique of concentrating the reactions of physical dynamic forces occurred in/by elements inside the engine, to be used positively in engine output benefit.
4. The engine characterised as in claims 1, the said engine does not have energy-lost stroke, all piston displacements in any direction will act positively during the work for the benefit of engine output .
5. The engine characterised as in claims 1, this engine is using the exhaust gases potential aerodynamic reactions to increase engine output, by using a technique of utilising physical concept on a modified exhaust openings to reflect a turbine reaction directly on the engine .
6. The engine characterised as in claims 1, this engine is efficiently using pre-compressed air-fuel mixture to be boosted vertically on the axis of modified turbine(s) contains flexible elastic piston(s) in this spark engine to utilise many concepts together when fuel combustion occurred to provide the different characteristics of piston system as economic and easily controlled, in additional to the best characteristic of Jet system in the speedy accelerated powerful output, to establish connecting bridge on that wide gap between piston engines and Jet engines by this compact system.
7. The engine characterised as in claims 1, this spark engine is efficiently using the pre-compressed air-fuel mixture by almost independent device to be boosted(or supercharging it) to the chambers to provide the best status for fuel combustion in squeezing the power on pistons and to have rapid acceleration in this discipline
8. The engine characterised as in claims 1, this engine is using the principle of Puffing air on each chamber i.e. piston cup directly at the end of stroke exhaust while still hot for expelling (scavenging) exhaust gases, for reducing heat of chambers in each cycle, providing perfect adiabatic effect, exchanging total exhaust gases and cleaning what could be left of soot, even the pressure and temperature of this air feeding could be controlled, this mission could be repeatedly done in highly speed perfectly in each double revolution of a

chamber as automatically, consecutively and harmonically with other chambers, since the system providing this ability of independent performance.

9. The engine characterised as in claims 1 and relatively to claim 8 this engine is using a built-in technique to reduce the pollution of exhaust gases within the engine, by puffing pressured air directly on the hot gases in each chamber while still hot at each end of its exhaust stroke, which will complete the oxidisation of all exhaust gases i.e. those sensitive CO & NO_x (and SO_x if exist) to be oxidised into friendlier status before expelled to the environment, it is also a way to prevent acid rain, this mission could be controlled for adding extra anti-pollution factors.
10. The engine characterised as in claims 1, this engine using flexible elastic push-arms for pistons with the free various elastic displacements as this discipline utilise them all positively and effectively on the engine output, by a way of maintaining a perfect fuel combustion in each chamber, by exactly the required extension for chambers space to act in association with other engine effects as this is a flexibility of this system to use any mix rate (different compression effect) upon any piston while engine in performance, it could use different fuel (in octane factor) without mechanical disturbance, keeping the actual required chamber's combustion space for any fuel, keeping the best firing situation for any fuel efficiency to be utilised, terminating knocking, rumbling problems, this system is providing the flexible harmonic distribution of different fuel combustion intensities in the chamber to be transferred all positively to engine output automotive power.
11. The engine characterised as in claims 1, this engine is using easy way of feeding the air-fuel mixture to each chamber as in the same (uniform) ideal mixture for all by one fuel spraying mechanical device to feed all chambers, or by using a separate (independent) spraying devices for automatic control feeding for each piston unit (or group of pistons) separately in this system to have the precisely required performance for any application to reduce its fuel.
12. The engine characterised as in claims 1, this engine is using a specific principle of distributing oil services from central supply canal(tunnel) inside its straight crank via metal pads by utilising the Centrifugal concept on engine rotation, for discharging oil outwardly to engine case, providing good adiabatic efficiency with good oil distribution to engine parts related to its speed, the

- engine oil tank far from hot combustion gases of chambers preventing expected oil smoke due to penetrating of these gases leakage on oil sump.
13. The engine characterised as in claims 1, this engine is using independent device for oil service in each pistons by its private pump working relatively to the piston's displacement, supplying the required oil quantity for each piston, (for piston wall touching cylinder wall) independently as the piston demands.
 14. The engine characterised as in claims 1, this engine is using simple mechanism to bear any power range by transferring it to a sliding free rotating reaction by a straight crank mounted on it wheel(s) consisting piston(s) of flexible elastic displacements, the additional effective reactions which acting positively on engine output by employing a criteria of this system in utilising the advantages of this circular shape of wheel(s) in the engine could be called additional spherical sustained reaction of this system on the said fuel output.
 15. The engine characterised as in claims 1, this engine has ability of conducting parts of engine performance needed for any engine application, maintaining sufficient independent parts of engine in work as needed for the required engine output, by the ability in using independent feeding devices for each engine part, providing the exact consumption to reduce fuel for any work.
 16. The engine characterised as in claims 1, this engine has the ability of providing auto-output performances, by the ability of controlling any piston performance, any piston could work or stops as required during engine rotation, despite they are all on the same crank, this would be happened without influencing on other parts in the engine, related to the engine design concerning the pistons and/or wheels numbers in engine, and a control of the accessories , this provides the pioneer characteristic of this system
(The Automatic Output Power Engine, SHIRWAN SYSTEM).
 17. The engine characterised as in claims 1, this engine is using a specific design of the free flexible elastic push-arm for pistons, with chambers placed in the wheel outwardly circumference, employing the circular shape with its miracle physical advantages in reducing the linear movement of working pistons due to increasing rotary speed of wheel(s) inside engine, the piston's depress decreases with the increase of revolution speed depending on a natural concept of a dynamic circular body rotating and accelerates by

consecutive linear force(s) effects on the same rotary direction which will not stay as the same premier force(s) effect while increasing wheel rotary speed or to keep a constant speed , this criteria will be used to reduce linear force of piston(s) acting on a wheel which would be used to reduce the fuel needs required for the consecutive explosions in chamber(s) having reduction in its expanding, due to reductions of piston(s) displacements, means this system as it is boosting(charging) air-fuel to engine, it will reduce its fuel consumption while increasing its speed by utilising the speed-factor in this physical concept.

18. The engine characterised as in claims 1, and relatively to claim 17, this engine is using the principle of utilising Centrifugal concept directly in highly speeds, to reduce the fuel consumption also, as this connected with the circular placing of the chambers with free movement of all pistons related with the weight of pistons masses and an assumption existing mass for the gases in these chambers, while keeping the same reaction on the wheel(s), at highly various revolution speeds, physical centrifugal reaction will be reflected by gas pad as a balloon inside these mentioned chamber(s) to act again on the same positive direction of fuel combustion inside the engine, this means extra descending in the said fuel consumption with the speed increase in this engine, it means this is a second way of countering the fuel consumption while increasing the speed, the indicator diagram for both claims 17&18 would be used in approaching a theoretical situation of minimum piston linear reciprocated displacement to program a computer control system for actual required feeding to reduce the fuel consumption that needs in highly speed, related to the engine & loading.
19. The engine characterised as in claims 1, this engine is using valves for chambers, controlled separately without using the essential articulated timing connection, e.g. a cam-shaft, this integral system is cancelling the main old slipping stress bearing points those exist on conventional engine's crank and cancelling those articulated parts and their weight in this new engine.
20. The engine characterised as in claims 1, this engine has a discipline seated to provide facile ways in regulating and adjusting all engine activities, i.e. control of fuel consumption, output power, pollution treatment quality, the pre-heating of the engine , oil-cooling system, the use of aerodynamic power in output and the termination of the defected piston, the contact status of radian

- seal in Case with wheel(s) as could be controlled mechanically or by thermal adjustment in relation to engine speed or when to be in used for Auto-Engine.
21. The engine characterised as in claims 1, this engine could be modified easily for various kind of power output, if keeping the same general dimensions, by only changing the qualification of elastic push-arm for group of pistons or all, with little changes in the fuel mixture feeding device(s) if required that is because of the free circular sliding discipline of the engine to bear any range of potential power and more it is depending on piston elastic push-arms.
 22. The engine characterised as in claims 1 this engine could be in wide options depending on this system principal, for various proposals as different in power wheel numbers or diameters, cylinders(piston) diameters or cylinder numbers in each wheel, or even in dimensions of all these in one engine for the wide application Auto Engine, a connected hydraulic system for two pistons in one wheel could be used also to exceed expelling of exhaust gases more rapidly, a differential cross-diameter of push-arms metal spring could be used.
 23. The engine characterised as in claims 1, this engine could be used vertically as its crank in vertical direction as a vertical engine performance, that is because the oil services here are depending mainly on the Centrifugal concept, and the air-fuel is boosting to the engine the speedy output efficiency would make this integral compact engine system is the most suitable for the promising small Hoover Craft and other flying equipment . (Fig 23/25).
 24. The engine characterised as in claims 1, this engine could be designed in a dual or more ignition spark plugs in big diameters wheels, depending on the same system principal considering all the requirements, the exhaust openings could be placed as required or even used with moving adjustments
 25. The engine characterised as in claims 1, this engine could be used easily as a group of different-power unites (engines) on the same crank, to work as one engine for heavily application(generations) each engine could have its own oil services and control, to work or stop without influencing on other because of the sliding rotary design with independent effects of parts.
 26. The engine characterised as in claims 1, this engine could use gasoline (benzene) in different kind of octane or Jet kerosene or even Gas fuel in the same principal, the existing of flexible piston push-arm could provide this capability, by just changing the feeding accessories or pistons push-arm.

27. The engine characterised as in claims 1, this engine however controlled by its pressure of feeding its options of Auto-engines for multilateral-purposes in performance could be provided by different proposals of modifications as ,
A / Air-fuel mixture feeding pipe with controlled inlet for feeding pistons of wheel (the piston in any wheel- unit) by inlet valve regulator or management,
B/ Air-fuel mixture feeding pipes with controlled inlet for each wheel unit ,
C/ Different pistons diameters for any wheel with their particular accessories,
D/ Different pistons numbers in any wheel with a modified distributor ,
E/ Different wheels diameters with their particular feeding accessories,
F/ Different piston push-arms (elastic resistance) for any wheel(s) that might be used in a specific applications as a wheel unit(s) for fast acceleration, high speed or in extra heavily work or idle work, or related to other kind of fuel used,
G/ Exhaust opening places, angles, for the wheels its wings direction it could be moveable as required and the location of the last exhaust seal ,
28. The engine characterised as in claims 1, this engine is using maximum fuel potential energy in output to be a powerful engine because of ,
A / Its longer effect and constant moment of piston Power stroke on Crank,
B / Its pistons strokes acting all positively on engine output no stroke lost,
C / Its minimum combustion energy lose due to its sliding rotary mechanism,
D / Its utilisation of the potential elastic effect of elements inside the engine,
E / Its utilisation of perfect combustion for air-fuel mixture in chambers always,
F / Its way of using the pressured boosted air-fuel mixture into the chambers,
G / Its utilisation of the aerodynamic power for exhaust gases in output,
H / Its utilisation of the physical powers reactions occurred inside the engine,
29. The engine characterised as in claims 1, this engine is suitable for computer age since its parts perform independently to fit prepared programs.
30. The engine characterised as in claims 1, this integral engine would eliminate the gear transmission box in a vehicle if used as Auto Engine, it has simple fuel spraying devices, it has safe high speed efficiency as the more speed the less vibration(i.e. less distance of pistons displacements) with high adiabatic efficiency, this system has wide options since it could use those various elastic devices used in refill usual automatic weapons such as canons or machine guns to change those products to mankind civil purposes ! . +++

■ - **SHIRWO SYSTEM** - (1st marked up copy)

(NEW INTERNAL COMBUSTION POWER SYSTEM)

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JUL 21 2003

Group 3700

INTRODUCTION

{ This is a brief research {of a new system's design} prescribing practical system for a combustion engine {with} provides a better {fuel's utility} for fuel's energy by a design that could add more potential powers to engine output with perfect control for combustion intensities inside the engine to perform independently in harmonic effect, a system of different technologies associated in a simple economic discipline with wide options, to reduce the actual fuel consumption or to maximise the real potential fuel output, {by using more potential powers in this system due to improving and maximising the fuel energy then computerising them to increase torque power in a small simple automotive power engine. With economical industrial methods of manufacturing and more advanced practical ways of controlling engine activities for various engine outputs with improvement of fuel consumption. }

{It was a ten years old dream of the inventor to design a powerful internal combustion engine, flexible in operation with its economic fuel consumption and more harmonic in performance ,utilising the computer progress .By this technology .A power engine that could become so close to Man's order to be as a living object.}

It has been more than hundred years since that invention of Otto petrol internal combustion engine had appeared, still used until now to supply automotive powers. The fast progress in the world, the economical problems, the lack of energy, the increase of pollution on earth, make it necessary to develop more advanced automotive system, A compact engine that could convince the environmentalist organisations and the consumers ambitious to use a system depends on improved techniques to suit the computer age, in the main time providing methods to get use of those huge industries of regular weapons products, to be for civil efforts. Thus such advanced system in specifications, economic and has best utilisation for fuel energy with less pollution effect, is required to provide a promoting solution for the near future problems,(referring to 'Kuoto' summit 1998 about industrial pollution).

{A new environment-friendly generation of a clever combustion {engine} engines {may appear}, is about to be appeared {since} it depends on {those technique and universal physical principals, those used in flying and beyond it i.e. spaceship flying in atmosphere free } a solidarity of many scientific concepts, some defining natural events or has been used in atmospheric flying missions, even beyond it in the

space away from earth's gravity; all inside this {engine} compact automotive discipline. {Of course many diverse scientific researches are needed for developing its fabrications (theoretically) in order to reach the best conclusions for various proposals in implying this system for different kinds of work with best economical commercial productions for each.}

{This concept contains extensive principles, it needs to be developed scientifically and mathematically in Classified industrial laboratories to conclude the various designs according to the production `s standard requires.}

{It has been more than hundred years since the invention of Otto petrol internal combustion engine had appeared, still used until now to supply automotive power. The fast progress in the world, the financial developments, the economical problems and the increase of pollution on earth, make it necessary to develop a new automotive engine . A new system that could convince the environmentalist organisations and the consumer recent requirements by using advance technology with computer control with better specifications and performance by this system. Thus it apply promoting solutions to future environmental problems with economical in, production and fuel consumption.}

It was the inventor's dream ten-years ago to become true at the same time when an industrial community like US Gov. had appealed on 1995 to find more advanced automotive system for the future. This powerful system is flexible in operation and harmonic in performance, An automotive engine, that could become so close to Man's orders as much as close to alive object in work than just a machine.

This system utilises various scientific concepts participated in its missions of performance, it needs professional experts in I.C., automotive mechanics, hydraulics, aerodynamics and essential in physics knowledge, to be able to assess together the compound conclusions implied in the criteria of this power system.

Of course more diverse scientific researches in classified industrial laboratories would be needed later on for developing its various and wide options mathematically and practically (by using computer formatting). In order to reach the best commercial standards in using this system for different kinds of applications .

It's time to reconsider the way of using the potential energy of Petrol fuel in producing automotive energy for the light power equipment. In away to improve the principal of fuel combustion in {the} engines to {be} make in its maximum useful

potential advantage {in producing torque} to produce automotive power {inside a small simple economic machine.} by employing natural universe concepts inside engine discipline using advanced techniques depending on wide scientific knowledge to make these concepts employed under control inside the engine to be utilised to provide more output power for the fuel in the power engine.

{using the facilities of advanced scientific techniques and the recent progress of computer control systems in most industries.}

{ Wishing to} Hopefully this could be a {very} real useful automotive system to solve future problems {in} by a better {use} way in utilising {of} Petrol-God's generous gift to {Man} the mankind, the best powerful {valuable} available cheap fuel material in the earth {;by an efficient ways of utilising automotive energy from it with economical consumption hopefully to be used } in this economic design which is suitable for the future strict regulations and workable for computer age to fit the 21st century {,and} to be declared and invested {by all the world} for {peace} mankind peaceful purposes {and human progress }

This {system`s} research:

This a brief {configuration} research contains: description, design's principal (back ground) major changes, {design principal (back ground) , composition} compositions & accessories, typical engine performance {,& analysis of} conclusion of analysing potential ways of producing torque power, useful industrial & commercial characteristics, {it's} various design proposals, drawings contents, drawings(Figs) details, abstract and then the {&abstract } Claims & abstract.} all in on 46 pages with a set of 25 drawings.

(Inventor personal wording prescribing most considerable sides of this invention.).

..... **DESCRIPTION**

S-H-I-R-W-O: { (SPEEDY, HARMONIC - HYDRAULIC , INTENSITY, ROTARY, WHEEL, OPERATING) }

(SPHERECAL-SUSTAINED / HARMONIC-HYDRAULIC/ INDEPENDENT-I.C.- INTENSITIES / ROTARY-REFLECTED-REACTION / WHEEL(S) / OPERATING).

{SYSTEM: A SPECIAL MECHANICAL DISCIPLINE FOR INTERNAL COMBUSTION ENGINE.}

S. : System : A SPECIFIC MECHANICAL DISCIPLINE TO MAKE THIS AUTOMOTIVE ENGINE WORKS TO PRODUCE TORQUE OUTPUT (FROM FUEL ENERGY).

{A new compact power engine designed to use the fuel chemical energy in specific relations with additional natural physical forces by using of many dynamic principles computerised by new techniques of this mechanical metal machine to produce better torque output powers.

This is a mechanical engine of internal combustion system, produces torque power from Hydrocarbon combustion energy using any types of gasoline fuel or could use Jet kerosene or gas fuel in this principal; to produce powers from expanding gases volume i.e. pressure of gases that result from fuel fast burning (combustion emission gases) in closet chambers, and transfer these powers to torque movement, using specific but simple components working in one connected system that applies additional potential powers to normal said fuel energy and provides pioneer industrial and commercial characteristics in a compact power engines.}

A new internal combustion compact power engine in a discipline providing smooth sliding mechanism with flexible performance using the fuel potential chemical energy for internal combustion in relation with additional effects due to employing techniques of using Natural Physical dynamic forces inside the engine to provide better output from the said fuel, a system consisting many theories working in association inside a simple mechanical discipline to utilise the maximum fuel energy for automotive power output, with minimum energy lost, in the meaning of reducing said fuel consumption related to weight-power ratio for engine output.

{A practical engineering design that composes types of recent combustion principles, which produce torque power from fuel: piston, rotary and turbine in one compact composite system engine unit.

This system with its mechanical design will use a new way of circular distribution for pistons locations in engine case with the advantages of this locations in the work that apply more potential powers to fuel (additionally) on engine output with other good advantages.}

This system is designed to achieve the best mechanical way in transferring fuel combustion to automotive reaction, by using all known principles in one time with minimum power lost inside engine, moreover it provides ways to use physical

effects which appear due to elements dynamics inside the engine to be utilised for its output benefit.

{This mechanical system is designed in away to use the fuel **chemical** energy in high efficient manner and adding to it : almost in-visible powers.

After the instance of fuel combustion . There will be powers that can be agitated due to the physical dynamic principals which are placed to happened inside this discipline . These nature powers that agitate due to dynamic effects on the elements will effect due to this mechanical design .}

{By utilising the advantages of specific gas characteristic in closed chamber (combustion gases in the chambers) and the ways of chambers placed in the circular zone in this engine . There will be powers that agitated. The aerodynamic energy of the hot exhaust gases of the chambers will be agitated also in a specific way to be used. This engine's discipline will computerised the distribution of these powers to effect all positive resultant on the same direction -with the fuel mixture combustion power - on torque crank to maximise the output power in the engine for the said fuel .}

This practical engineering design composing types of the recent combustion principles (those used separately to produce automotive power) the piston, rotary and turbine to perform all together as one compound system in this compact engine unit, and adding to it new principle of employing the inside physical dynamic reactions of engine's moving elements; all to provide maximum fuel utilisation in output. The system is a simple discipline using wheel(s) mounted on straight crank inside a case to rotate therein , the wheel(s) contains cylinder(s) for piston to move therein, the piston has a chamber defined as the space between piston top and the case internal wall with the cylinder bore surrounding the piston top, the piston is mounted inside the cylinder by free flexible push-arm connected it with cylinder base, to hold the piston and to transfer its flexible movement effects to the cylinder base then to the wheel containing it, with designed ways of isolating chambers, adapting services and conducting the parts in this discipline.

{These physical energies used to be ignored until now .That is because the conventional engines depending only on the visible effect of the direct fuel explosion pressure power inside. Neglecting the physical energy effect that could happened due to specific dynamic movements on the elements ,inside the engine movement

if they were put in the right way . Since there is no discipline to concentrate these energies to be used positively in these engines. }

{ This is a new way of magnifying the fuel potential chemical combustion energy by existing the dynamic nature physical principals inside the discipline of the engine and using the resultant to increase the engine output for the said fuel. many powers would result due to the discipline of this design .These will be utilised to act all **positively** on the same target i.e. magnifying fuel combustion power output, maximising this said energy that used for the same application . It will increase the output and reduce the said fuel consumption.}

This engine system produces torque power from Hydrocarbon combustion energy, by utilising the extension and pressure of emission gases after fuel combustion in closed chambers. In addition to that, this integral engine discipline will agitate and concentrate physical forces which appear inside the engine i.e. aerodynamic force of exhaust gases and physical dynamic effects of moving elements, to transfer these component forces as one resultant acting on the same target to apply more potential power to the combustion power of a said fuel. This system is designed in away to be flexible and harmonic in performance and could use any type of gasoline(octane)for fuel or Jet kerosene or even the gas fuel, dealing with fuel chemical energy in high efficient manner and adding to it - what could be said the indirect or invisible -inside physical powers(the resultant could be called the spherical sustained reaction). This system is using new technologies to arrange methods for employing natural physical concepts to be implemented inside the engine then invested practically for the benefit of the engine output .

THE PRINCIPAL OF THIS SYSTEM DESIGN (Back Ground) :

{The conventional pistons combustion engines depend on a set of piston cylinders fixed in engine case (chassis) using reciprocated push-arm between pistons and a zek-zak crank shaft connected with them in determined angles by mounting frictional minimising pads, transferring torque depending only on this direct contact principle of dynamic.}

The conventional piston combustion engines depend on a set of piston cylinders fixed in engine case (chassis) using reciprocated push-arm between pistons and a zeg-zag crank shaft connected with them in determined angles by mounting

frictional minimising metal pads, transferring torque to the crank depending only on I. C. effect on pistons via push-arms in direct contact movement to produce power.

{This mechanical design are seated up in a discipline to use the direct contact dynamic and also by deliberates and **agitates** some physical energies, to appear then producing potential positive influenced powers that all will act in the same way with fuel i.e. in applying powers on engine crank.}

In fact those systems depend on fuel explosion but its effect should be always limited relatively with the constant piston displacement in cylinders -at all times - no matter how engine situation is, as their designs connecting all pistons with the crankshaft that is way their main problem is to provide precise ideal mixture control with its complications in order to keep equal displacements on all pistons always .

The positive summation reaction (resultant) of those energies will devolve to act positively on output after fuel combustion occurred inside chamber(s), which could be driven to produce more output power on the crank; as the system's extra physical powers.

This positive resultant power reaction due to the system design (at typical mod) of:}

Those conventional engines depending on the direct reactions of fuel explosion-pressure power happened in the chambers only, depend on articulated mechanism neglecting other effect of physical forces that happen due to elements movements.

Although those engines have high rate of fuel power lost inside because of their machinery, appeared by the meaning of bad side-effects as friction, heat, vibration, noise .etc. , causing a lost in part of fuel output in these engines, there is still no conventional engine design tries to concentrate physical dynamic forces happened inside automotive engine after fuel combustion to be used positively in its output.

This new design is seated in a discipline to use potential power of fuel combustion occurred inside pistons chambers as direct contact on its pistons with ability of flexible displacements (not constant displacement), to transfer any range of fuel power, besides employing natural physical concepts inside the engine by a design devolving its elements to agitate then deliberate these concepts, to have their effects acting consecutively positively to provide effective physical potential influenced forces to increase the final engine output.

The effective physical resultant power (at a typical mod) due to reactions of :

{1.Natural elastic characteristic of element(gases, spring or hydraulic device resistant)}

1. Natural elastic characteristic of elements (elasticity of push-arm and gases).
- {2. Natural aerodynamic power of gases by the potential energy of exhaust gases.}
2. Natural aerodynamic force of gases by the potential effect of exhaust gases.
- {3. Natural physical principle of the centrifugal potential power (appears at high speed)}
3. Natural centrifugal potential power of rotating parts (appears at high speed).

{These natural energies appear due to movement effects on elements in this discipline which let new potential energies occur, instantaneously after the occupation of fuel combustion in chamber of (said) fuel then maximising output in this system. The positively reaction of any of these power will be in relation to engine design and speed situations.

The mechanical design of this system would keep a minimum energy lose (from combustion power) inside due to it's simple machinery (recent systems lose rate 20-40% due to their, machinery parts, friction, heat.....etc) which affects on the power-weight relation, thus this system could assume:}

This system arranging ways of utilising physical forces appeared consequently due to fuel chemical combustion energy inside this compact internal combustion engine, in the meaning of making these reactions working for the benefit of fuel output, by concentrating the physical dynamic effects of inside elements movements instead of losing them as a lost energy inside the engine (as in conventional engines).

{Almost total potential fuel combustion's energy will transfer to torque power.
Although the speed could be invested in this design in reducing the fuel consumption automatically.

The main target (by the inventor) of this system was in setting separate power units in one engine and the ability of changing any units performance output automatically by easily management from out side; in a small compact engine. The scientific research could conclude from the following description that ,this new spark internal combustion system: in a small compact engine. }

This design is seated to employ and utilises natural physical concepts by making them appeared within the inside element movements in away to use the reactions as components acting positively in producing spherical effected resultant on the same target of fuel to apply additional torque on the straight crank of this engine, to magnify said fuel combustion power in output, in relations to the engine design

and/or speed and load situations. This new compound concept is working in association with the fuel combustion inside this integral mechanism engine with its easily controlling ways; will increase the said fuel output or reduces said fuel consumption for any application.

{The scientific research could conclude from the following description that ,this new spark internal combustion system: A system of **any piston (or group) can work independently maintaining smooth performance without disturbs engine efficiency, a system utilising the potential physical powers in output and can counter the fuel consumption in increasing speed.** This system could be performing as a multi-purpose engine depends on types of works. An engine of economical production by deducting many industrial requirements, reducing the lines of production these mean reducing costs.}

The system mechanism will transfer all physical powers occurred inside engine to a kind of spherical resultant added to fuel combustion which already will be transferred to produce final torque output inside this system in a way keeping minimum energy (i.e. combustion power) lost inside this engine due to it's simple machinery (recent systems have loss rate of 15-40% due to their machinery as friction, heat & noise) which will be affected on the power-weight ratio in out put . This system is dealing with almost total potential fuel combustion's energy to be transferred to torque power, in a discipline providing perfect adiabatic efficiency .

The system is investing speed as a physical factor to reduce its fuel consumption.

The main seen achievement on this power system was in existing independent power units in a flexible engine that any part could bear different ranges of fuel power or even stop without disturbing the engine mechanical efficiency keeping harmonic performance with its ability to have automatic control for engine parts.

{The design will provide many good industrial techniques briefly like:

A better engine performance, less fuel consumption, a perfect with flexible or automatic output, a built-in pollution treatment, a devisable design proposals less industrial requires, economical productions and easy, long duration maintenance and perfect computer control for almost all the engine activities and other things. }

This is a **system of any piston (or group) can work independently maintaining smooth engine performance without disturbing its efficiency to be as auto-power engine unit for various applications.** a system utilising the inside-engine potential

physical powers for the benefit of engine output and could counter said fuel consumption in highly speed. The conclusions on this system would observe many good characteristics such like: better output performance, less fuel consumption, automatic power, a built-in pollution treatment, computer control for the engine activities, the long duration for easy maintenance with variety of design proposals.

All these could be found in this simple fabricated compact engine system.

MAJOR CHANGES (IN TECHNIQUES) :

{The techniques in this principal totally differ from those recent systems, known as: **Otto, Diesel, Wangle** or those with modified DOHC, SOHC or even **Turbine system**. The global change is in the basic design from those internal combustion engine: it is by using wheel(s) inside engine; containing piston's cylinders in a discipline that could transfer fuel energy with additional potential energies into torque power in the engine beside other major changes which would apply good industrial advantages.}

The techniques in this principal totally differs from those used in the conventional systems (Otto, Diesel, Wangle and those with modified DOHC, SOHC or even Turbine or Jet system). The main change is in the participation of the systems of piston, rotary, turbine with the novel principle of utilising the benefit of physical effects inside the engine, to perform all together in association, to produce a better output and/or to increase the fuel efficiency in a compact engine. The changes are:

{ A system of various power stroke, one or two or three or more piston power strokes as required(at the same, piston-bearing zone part-on the crank);at one crank rotation!}

A system of various power stroke, one or two or three or more piston power strokes as required (on the same part of crank) at one crank rotation, no energy loss stroke for all pistons displacements i.e. all react positively on engine output .

{ A system-using engine with rotating wheel(s) fixed on straight crankshaft .}

A system using straight crank shaft and wheel(s) mounted on it contains piston(s).

{A system of independent piston performance related to crank shaft or other pistons.}

A system of independent piston performance related to the crank or other pistons.

{A flexible (elastic characters) piston push-arm to transfer potential energy to torque.}

A system of free flexible (elastic) piston push-arm to transfer potential energy .

{A system using charged (pressured)air-fuel mixture (beyond turbo);in spark engine.}

A system using pre-compressed air-fuel mixture to charge it to a spark engine.

{A system combining piston & rotary & turbine techniques in one compact engine.}

A system composing piston & rotary & turbine performances inside one engine.

{A system of different cylinder and other type of valves in the discipline and places.}

A system that employs & utilises Natural Physical concepts forces in its output .

{A system that agitates & utilise Physical nature's principals energies in output .}

A system utilising aerodynamic power of exhaust gases to act as a turbine output .

{A system using aerodynamic power of exhaust gas to act as turbine output power}

A system that could reduce the high fuel consumption; due to the speed increase .

{A system that could reverse the, high fuel consumption; due to speed increase.}

A system of less fuel combustion energy loss due its simple sliding machinery .

{A system with less transferred combustion energy Loss to torque by its machinery.}

A better fuel combusting in all engine situations using flexible-space of chambers .

{A system leads to set an automatic parts performance output unit in one engine.}

A system leads to set automatic-parts performances as auto-output engine unit .

{A better fuel combusting in all horizontal or vertical crank (torque shaft); direction.}

A system could be used in horizontal or vertical way relatively to the torque shaft .

{A system of good output, slow or high speed, safe performance in one engine unit.}

A system bears different power ranges in harmonic performance for various speed.

{A system treating pollution in practical ways with a built-in techniques engine.}

A system treating pollution in a practical way with a built-in techniques in engine .

{A system cheap less industrial requires and simple in maintenance.}

A system of discipline provides high adiabatic efficiency inside automotive engine.

A system of efficient conducting for its activities to be suitable for computer age.

{This configuration is theoretically expected, it depends on scientific principles and could be developed and practically concluded. More new extensive characteristic could be reached by the assistance of the specialised automotive laboratories using the available advanced techniques of: the metal alloys, dynamic principals, liquid hydraulic data , information available for composition's elements , the required dimensions with the industrial specifications and assistance of computer processing in design, even in management of control the engine activities and various performances for multi-power output for development of this system. This new system with it's design principal and its principles included will change the way of transferring the fuel energy to torque power, maximising this energy than before. Using simple applications depending on different mathematical equations from those

used in recent internal combustion systems, this system will apply extra value for fuel energy.}

The pioneer characteristics of this system could be concluded and practically approved by analysing the main scientific concepts implied inside, which are in :

I.C. , dynamics, hydraulics, aerodynamics, physical concepts, powers analysis, metals technology and pollution treatment, these sophisticated subjects are associated in the performance of this system which required various mathematical equations more than those used in the regular systems, to achieve the required criteria for each option on this compound but easily fabricated automotive system.

{The fundamental principal for this system and it's principles, could be developed to be used now as: **a new advanced system**, whenever these facilities available, or a part(s) of its principles could be used now (i.e. **partially used**) in order not to interrupt or influence those recent automotive industries in order to prevent any sudden commercial impact in their productions.

However using any of these principles should be referred to this **(research)**.

MANY SPECIFIC CHARACTERISTICS WOULD BE INDICATED IN THIS CONFIGURATION.}

THE MECHANICAL COMPOSITIONS & ACCESSORIES OF THIS DISCIPLINE

{(Compositions as per the typical drawings of the three of -2- pistons wheel unit's engine) } Compositions as per the enclosure typical drawings of :-

An Engine of three wheel units of 2 pistons in each wheel using Gasoline :

{1. Out side Case (the engine body chassis) a metal cylindrical or octagonal shape (as in the drawings) with a diameter of 330-380 mm in horizontal-position on crank and approx..length (as drawing) of 550-650 mm with a large cylinder cavity of 301 mm. Contains trenches for seals, tunnels for oil, water and places for valves with special exhaust openings. The industrial requirement may divide it into two parts upper and lower or more. (Det-2 Fig : 2/25 &, 3/25, 4/25).

The manufacturing of engine case by coated steel alloy with trench's & tunnels.}

1./ Out side Case (the engine body chassis) a metal cylindrical or octagonal shape (or as the drawings) with a diameter of 330-380 mm in horizontal-position on crank and approx. length (in drawings) of 550-650 mm has a large cylindrical cavity of 301 mm. Contains trenches for seals, tunnels for oil, water and places for valves with special exhaust opening, design & assembling requirements may divide it in parts

upper and lower or more, and could permit to cast it in two layers of different alloys with trench's & tunnels. (Det. 2 , Fig : 2/25 & 3/25, 4/25) {2. The Crank (as crank shaft) a torque output shaft is a straight black solid steel iron, placed on the horizontal centre line of the engine along the Case length and extended more, its diameter 25 mm-50mm at the connecting points with the Case by ball bearings, which allow it to rotate only on its centre line. It may contain oil tunnel in the centre line contains holes for linking oil feeding to rotating parts. Its surface geared (grooved) to interlock with the rotating parts to move together. (Det-6 Fig : 2/25 & 4/25)}

2./ The crank (as main crank shaft) a torque output shaft is a straight solid steel iron, placed on the horizontal central line of the engine along the Case length and extended more, its diameter 25 mm-50 mm .The connecting points with the Case by ball bearings, which allow it to rotate only on its centre line. It contains central oil tunnel in its centre line, contains holes for linking oil feeding the rotating parts. Its surface geared (grooved) to interlock, trinket with the rotating parts to move coinciding all together as one system. (Det. 6, Fig : 2/25 & 4/25)

{3. Power wheel units (Energy production units) metal wheels (3 in this drawing) each one is a solid strong light alloy wheel, a diameter of 300 mm and a width of 120 mm with smooth surface(s) strengthen by (anti smashed) alloy, contains (here) two cylindrical hollow (cavity) with opening placed in opposite directions with smooth internal surfaces Bore -}. 3./ Power wheel unit (flywheel unit) a metal wheel (3 in the drawings) is a solid strong light alloy wheel, a diameter of 300 mm and a width of 100-120 mm with circular circumference strengthen by scratch-resistant alloy, contains (here) two cylinders(for piston) with outwardly opening placed in centre-side in opposite direction perpendicular to the centre axis, each with smooth internal surface bore and diameter (here) 80 mm and length of 120-180 mm depending on the industrial requirement data.

{The pistons placed in each one. Its diameter (here) 80 mm and length of 120-180 mm depending on the industrial requirement data. Each cavity base with two small oil stores (sumps) one which receives oil by tunnel linked with main supply tunnel (canal) in crank for intake lubrication oil to feed piston arm.

Other store of out let oil flow from piston arm to be disposal by other tunnel into wheel side. An opening between these two sumps in a way maintains the feeding store in a full situation always. The central grooved opening of the wheels to

interlock the connection with Crank (torque output shaft).} A piston placed to move in each cylinder adapted with its base, that has two small oil stores (sumps) one in which receives oil by tunnel linked with central supply tunnel (canal) in crank for intake oil store to feed piston via piston-arm. Other for outlet oil store receives oil via piston-arm then to dispose it by a tunnel into wheel side. The feeding intake oil store kept in a full mod always, if required by specific hole with outlet oil store. A hole the centre of the wheel to gear -interlock within Crank (torque output shaft). {There are two washers around the crank on the two sides of each wheel for oil lock. There are two trenches in outer circular circumference face of the wheel for fixing a pair of side circular gas-oil wheel slider-seals. The number of these wheels depending on the design and output ability of the engine.}

There are two washers around the crank on the two sides of each wheel for oil lock. There are two edge trenches in the circular circumference face of the wheel for fixing a pair of two sides circular wheel gas-oil-slider seals. The number of these wheels the diameter and cylinders depend on the design and output ability of the engine applications. {The direction of the longitudinal centre line of any piston's cylinder in a wheel differs from the near cylinder of other wheel in a known angle that could be found from dividing 360° by the numbers of total cylinders in a typical engine.

The crank may be trenched according to the wheel numbers for easy assembling that starts with cooling pad and wheels in required angles and ball bearings particularly i.e. all rotating parts to be geared together on the crank, by pressing exactly at its designed places before fixing the crank in its Case position. (Det-3, Fig 2/25 & 5/20)} The direction of the cylinders centre line in a wheel differs from a nearby other wheel's cylinder in a known angle that could be found from dividing 360° by the numbers of the total cylinders in performance for the engine. The crank may be geared with wheel according to the wheel numbers for easily angler assembling that starts with all rotating parts in the relevant required angles then ball bearings particularly i.e. all rotating parts to be geared on the crank, by pressing them exactly at the designed angles before fixing the crank in the Case position.

{The manufacturing of power wheels units could be done by costing alloys with trenches, setting drilling, welding tunnels, modified circumference and grinding cylinder bores as these would be the main standard mass production units in any engine design industry line for each proposal.}

The manufacturing of power wheels units would be done by casting alloys with modified geared hole to interlock with crank, drilling oil tunnels, trenched on edges, a smoothing circumference and cylinders bore for pistons these with Case tunnels design would be the standard mass production lines for any engine proposal . (Det. 3, 41 Fig 2/25 & 5/25)

4./ {The pistons: each one is of solid metal alloy high resistance light disk, fixed inside the cylinder with 20-35 mm thickness nearly the same cylinder Bore diameter. It contains in grooves the circular seals for gas and oil. There are suitable two middle inside tunnels for lubrication oil inlet and outlet that linked with the build-in pump at push-arm device top end.} The pistons: each one is from high resistant light disk of solid metal alloy, fixed inside the cylinder with 20-35 mm thickness nearly the same cylinder bore. It contains grooves on its circular wall for seals of gas and oil. {There are other smaller radial tunnels linked separately with each of these two middle tunnel and piston circular edge to cool piston and to distribute oil to piston wall with Bore surface. A special lubricating seal or two in the oil gap on piston wall to uniform the lubrication of piston circumference with cylinder bore, i.e. between piston and cylinder for good slipping movement. Minimising friction and heat while piston in movement:} There are two middle tunnels oil inlet and outlet inside suitable in linking the build-in oil pump on push-arm device from top end with piston, other smaller radial tunnels linked separately with each of these two middle tunnel horizontally to piston circular edge (to oil gap)to cool piston and to distribute oil to piston wall contacting cylinder wall. A special lubricating seal or two in the oil gap on piston wall to uniform the lubrication on piston circumference wall with cylinder wall, for good slipping movement, minimising friction and heat for the main anti gas and oil seals while piston in movement.

{The piston is connected by wash-bolts with its solid bearing base plate that capping the flexible push-arm. There is a solid steel ring at the top of cylinder Bore fixed in a groove to lock the piston in the cylinder at movement, A suitable curved piston top capping face required (Det.7 –Fig 4/25 & 8/25).}

The piston is connected by washer-bolts with its solid bearing base plate that capping the flexible push-arm beneath piston. A solid steel ring at the top of the cylinder wall fixed in a groove to lock the piston in the cylinder if required, A suitable curved top capping piston face is required to provide a suitable chamber shape,

manufacturing of piston by costing alloy with designed tunnels, grooves and seals ..etc. (Det. 7, 41,42 Fig 4/25 & 8/25).

The manufacturing of piston by costing alloy with tunnel, grooves and seals...etc.

5./ {The flexible piston push-arm of metal a pair of stainless steel pipes slipping inside each other (or a couple) fixed vertically on cylinder base inside it. A metal mechanical spring (straight or inclined) around or built-in with the push-arm, used. This method to maintain vertical piston movement.} The flexible piston push-arm is two pair of stainless steel pipes slipping inside each other (or 1 pair) fixed vertically on cylinder base inside its bore by two washer-bolts.

{A push-arm designed to work as resistance of elastic character with the required calculation for each proposal. A hydraulic device (like the shock absorber) working as a flexible elastic resistance system with particular reaction (capacity) depend on type of engine could be connected the piston to the wheel at cylinder base in vertical movement ability only (same that spring or device which used automatic weapons to re-fill, artillery guns etc). (Det – 8, Fig 4/25, 8/25 & 11/25).}

A metal spring (straight or inclined) around or a built-in with the push-arm body, is reinforcing it, the push-arm job is to maintain a linear piston's movement, it is designed to work freely as an elastic resistance for a certain required reactions (capacity) for each proposal depending on engine data, it connects the piston and wheel at the cylinder base for linear variable designed displacement distances inside the cylinder cavity, without being guided or guarded by essential mechanical cam shaft in the engine, also it could be of liquid hydraulic device working as elastic resistance i.e. similar to the devices used in automatic re-fill weapons as fast guns .(Det. 8, Fig 4/25, 8/25 & 11/25).

6./ {The piston lubrication pump, is made from pair of sliding pipes each of two small stainless steel pipes slide in each other contain tunnel inside it for oil, consist one way oil valve (check valve) for each inlet; in opposite direction (a valve, using solid small ball locked in a small chamber, an opening with a diameter less than the ball's half spherical shape and other opening of many small hole to let the oil flow at one direction for each position of piston movements) to act as ordinary shaft pump due piston movements (with push-arm). A pump of two opposite direction flow pipe shaft as in the drawing to work also as push-arm device...for example..(Det- 10, Fig 4/25 & 8/25).}

The oil pump for piston,(piston's private oil pump) is made from a sliding pair of pipes each of small stainless steel pipes slides in each other contains inside tunnel for oil, consists one way oil valve (check valve) in each inlet, or in opposite direction (a valve, using solid small ball locked in a longer size chamber of a curved end as a shape of the ball's half spherical shape with a smaller opening and other opening of many small holes to let the oil flows in one direction according to piston movement).To act as simple rod (shaft) pump due to the piston movement (with push-arm),sucking oil from the main oil canal in Crank via the inlet oil sump in the cylinder base, supplying oil to the piston then disposes it to wheel side-wall. A pump of two pair with opposite flow mounted inside the same push-arm device as in the drawings.(Det. 10, Fig 4/25 & 8/25).

- 7./ {The cooling & lubrication pads: each one of light alloy with radian trenches, starting from central sump to the edges attached the wheel side-wall, working almost same as a centrifugal circular pump. A diameter a bout the same of wheels, and an opening of oil feeding from central Crank tunnel to bring oil from the crank to distribute it on wheel walls, cooling them then disposed to the circumference edge then to Case inside wall tunnel.} The cooling & oil pads: each one is of light alloy plate of 10-30 mm thickness circular shape geared with the Crank attaching each wheel side-wall has radial trenches, (i.e. grooves) facing the wheel side wall, starting from central zone(pad sump) to the edge outwardly, coincided on wheel has about the same diameter and to act as a centrifugal pump (turbine), an inlet hole in the central linking oil from crank central canal via crank outlet which coincided with to feed oil to pad, then oil is distributed via grooves on wheel walls ,cooling wheel side-walls then disposed to the circular edge then to outsider at top portion of Case to oil service tunnels, (an air opening in ceiling of main oil tank is provided), {It contains low (or high) zones at the modified smooth edge in certain places against each chamber for slipping the mechanism bar timing system of the air and air-fuel mixture valves, for each wheel when rotating with the crank. This is the way of computerising the timing of valve opening against particular chamber, in the right time. It is a simple, easy, brief, oil moisturised and a perfect independent mechanism way crossing the Case for each wheel unit. (Det- 17, Fig 3/25 & 7/25).}
the pad contains at its last circular modified smooth edge, lower (or higher) zone(s) in certain places against its relevant chambers, for controlling the mechanism of slipping bar timing mechanism for the engine feeding valves as

rotates with the crank against the chambers in the right time, kept moisturised by oil always, providing independent mechanism feeding for each wheel. The other duty of the pads to provide adiabatic efficiency for engine.
(Det. 17, Fig: 3/25 & 7/25).

8./ {The seal mass(s) anti-gases, fixed in the Case: each of metal alloy (or hard anti-heat plastic combination) according to its work which is the anti-gas seal attached the wheel wide circumference face. It could be any size but at the same width of each wheel's circumference face. It is attached with the tow circular wheel slid-seals (the Case part) at the sides. A right depth fixed from outside on the case by special looked washer. It could be adjustable; if using adjustable seals (in attached) with the face of wheel by a mechanical controller spring regulator or (automatic thermal regulator).} The radian seal masses (anti-gas), fixed in the Case: each from metal alloy (or hard anti-heat plastic or carbon combination) designed according to its work, which is the anti-gas seal attached the wheel wide circumference face in coaxial to the Case. { The principle is on connecting between the two circular seals Case parts of each wheel and a well attached to the wheel circumference to supply a locked situation for chamber to prevent gases from penetration.

For a metal alloy it could be designed in a special way using linear metal seals, fixed in the base of the mass, with various technique methods of oil feeding using the advantage of one way rotation of wheels.

A relation with rotating direction and existing of special small inclined trenches on wheel surface in the right place (or on attached mass unite) with automatic opening for oil inlet and outlet holes. This could apply with timing pins in the rotating parts. Using the advantage of one way rotation monitoring oil discharge from Case (or wheel phase) starting before entrance of seal and disposed while wheel rotates at a duration enough to lubricate attached zone particularly. This would be guarded with spring solid balls in specific place with each mass with a timing system controlled by edge of one side pad of each wheel, (i.e wheel it self)}

The principle of these radian seals by contacting wheel circumference and keep on sliding on it attaching the two circular wheel edge seals (the Case part) at wheel sides to provide a closed situation for any chamber in that portion to keep constant mod (stroke) in that chamber independently for each wheel i.e. preventing gases of chamber from penetrating while its wheel rotating. A right depth fixed from outside on the case by a special locked washer and each could be adjustable for

contacting (attachment) with the face of wheel by a mechanical control spring regulator or (automatic thermal regulator).

For a metal alloy it could be designed in a special way using linear metal seals, fixed on a base to provide a mass of seal in that portion, with various technique methods of oil services using the advantage of a one way rotation of the wheels and oil discharge keeping on flow in the Case during engine work. (Fig 20/25) .

A relation with rotating direction and existing of special small inclined trenches on the wheel surface in the right places (or on attached pin-mass unite) with automatic opening for oil inlet and outlet holes. This could be applied with timing pins in the rotating parts. Using the advantage of one way rotation monitoring oil discharge from Case (or on wheel side phase) starting before entrance of the seal and disposes, while wheel rotates at a duration enough to lubricate attached zone particularly. This could be guarded with spring solid balls in specific place with each mass with a timing system controlled by edge of one side pad of each wheel, (or the wheel it self) . { Another way by applying holes in the circular gas seal system, the special timing controlled opening system depends on one way rotation (i.e. if using circular seal with blade rings in the Case-wheel interlocked parts) at seals. There are special holes on each blade ring that opened across as one hole when connect (blades) all in one fixed point(s) to set across opening hole for oil feeder from Case at required place. The direction of rotation and trenches in a part zone of wheel surface will collect the lubrication drops to the outlet hole (automatic opened) before gases attend reaching the seal mass from far chamber and before even the chamber reaches the seal position maintaining surface in a good slipper. However the gases pressure direction may be to dispose the oil in the right time. The number of these seal 3 to 4 and the radian distance between each one is less than the net radian distance between wheel chambers as the distance of specified attached surface. The lubrication technique are various depending on expert laboratories.}

Another way by applying holes in the circular anti-gas seal system, the special timing controlled opening system depends on one way rotation, using circular interlocked parts with holes at these seals. There are special holes on each blade ring that opened across as one hole when seal blades meeting all in one fixed point(s) to set across opening hole for oil feeder from Case to these seal masses at required places. { The working principle of these seal in their circular positions

around the wheel is to maintain and to transport the locked situation chamber(s) i.e. keeping mode of chamber-mix while each wheel kept in rotation.

These seal masses are in three types of work.

No 1 for one way anti-gas of air-fuel mixture; when start charging it and the place directly after pure air-valve.

No 2 for two sides anti-gas, a side for the charging air-fuel mixture although other side for gases of chamber after combustion, at place before the power stroke.

No 3 for one way anti-gas of the combustion gases at place before exhaust opening.

The radian distances between these seal are shown in (Fig -10/25)

The size of any seal mass could be designed in order to allow a piston's maintenance opening from its Case without open the engine Case regarding the simplicity of assembling the piston and push-arm device.

(Det- 19, Fig 4/25 & 5/25)}

The direction of rotation and trenches in zone of wheel surface will collect the oil drops rapidly to the inlet holes (automatically opened) by specific techniques on the circular seals which fixed on the wheel edges before gases attend to reach the seal mass, from the coming chamber and before even the chamber reaches the seal position, maintaining surface in a good slipper. However the gases pressure direction may be used to dispose the oil in the right time.

The number of these seals: 3 to 4 for each ignition duration and the radian distance between each one is less than the net radian distance between wheel chambers as the distance of specified attached surface, in any way providing various lubrication technique depending on the expert of industrial laboratories.

The working principle of these seals in their designed positions around the wheel is to maintain and to transport the locked-closed situation of chamber(s) i.e. keeping same status of mod in chamber ; while the wheel in rotation.

These seal masses are in three types of jobs (to work in relative to) :

No. 1 for one way anti-gas of air-fuel mixture; before starting the feeding operation on chamber and the place directly after pure air-valve in the Case.

No. 2 for two sides anti-gas, a side for the zone of charging air-fuel mixture, other side for gases of chamber after combustion, a place before power stroke.

No. 3 for anti-gas of the combustion gases at a place before exhaust stroke starting penetration from exhaust opening with particular specification .

The essential radian distances between seal masses shown in (Fig -10/25)

The size of any seal mass could be designed on bigger bas in order to allow a piston's maintenance preparation from the Case via this opening ,i.e. without open the engine Case to simplify any piston maintenance and push-arm device (also seal No. 3 could be repeated), (Det. 19, Fig 4/25 & 5/25 & 10/25 & 20/25).

9./ {The circular seal (wheel-case, oil seals-slider) on the two side's edge of each wheel circumference are (in various techniques). A suggestion of suitable two or three stainless steel blade rings mass fixed in special grooves in the wheel (or) with one set parts in Case and wheel to be interlock together when fixing the parts of the engine, using separated pair pieces fixed in Case, other ring fixed on operating wheel. The seals components would formed together a titling and a sliding device to protect the pads from any penetration of combustion gases (and maintaining the required locked chamber for air-fuel mixture). They could be lubricate with special holes in the right place where no longer pressure on it, (i.e. end of exhaust opening) or using a self-lubr. This depends on the expert industries laboratory (Det- 26, Fig 2/25 & 3/25).}

The circular anti-gas seals(wheel-case-slider, seals) on the two side's edge of each wheel's circumference, designed as required, a suggestion of suitable two or three stainless steel blade rings mass fixed in specific grooves in the wheel and/or with a part fixed in Case and other in the wheel. To interlock together when fixing all parts of the engine, as separate pair of ring pieces fixed in Case, other ring fixed on operating wheel. The seals components would form together a tighten and a sliding device to protect the chambers from any penetration of combustion gases (and maintaining the required closed chamber for all mod of mixture). They could be lubricated with special holes in the right place where is no longer pressure on it, (i.e. end of exhaust opening) or using a self-lubrication seals or as industrial design, (Det. 26, Fig 2/25 & 3/25).

10./ {The ordinary oil pump, which fixed in the front of the engine (or else). Connected with the crank to transfer oil from lower store tank – that oil flow coming from Case ended; to the upper oil tank which discharges the intake of the main tunnel of the central crank with its winging (impeller) parts. It is in a shape that could direct the flow of oil sucking by tunnel's inlet holes in crank which suck it when rotates to discharge it to pads or pistons in each wheel by its holes depending on the Central-fugal principle for each part. These hole in the crank could be in a

special designed in their opening diameter depending on the distance each from oil main tank (Dec 24, 28 Fig 2A/20).}

The usual oil pump (and subsidiaries) , which is fixed in the front end of engine (or else). Connected with the crank to transfer oil from lower store oil tank , that receives oil flow coming from Case end, to the upper(middle) oil tank which discharges the intake of the main tunnel in the central crank. In which it has its winging (impeller) parts, in a shape that could direct the flow of oil sucked by tunnel's inlet holes in crank which suck it when rotates to discharge it to pads or pistons in each wheel by relevant holes outlets depending on the Centrifugal concept for each part. These outlets holes to the engine parts in the crank are in a specific design for their opening diameter depending on its relevant distance from main oil supply (Det. 24, 28 Fig 2a/20²⁵). { The trenches in each pad will be filled with oil, feeding from Crank holes flowing due to engine crank ration directed out from centres by centrifugal energy due to rotation. The grooves in a way contacting the power wheel units two side-walls, for cooling as to reduce adiabatic. enthalpy heat system of each power wheel unit. The oil flow would exchange the heat of cylinders after fuel combustion. The pistons get their lubrication oil with the same principle, from a small tank (sump) in the base of each cylinder as in take store that would be refilled always (by arrange an opening in its top to the out let store with excess length of lab. intake tunnel). The demand of lubrication oil fore each piston would be supplied by its movement. The piston will take sufficient lubrication oil by its lubrication pump fixed in its push-arm that suck oil with the letter movement supplying the piston needs then due to flowing will directed out side by out flow tunnel to outlet sump then far from wheel centre to wheel side wall and drop it in pad trenches due to rotation by the same principle (Centrifugal principle) (Det:- 10,11,15,17,28 Fig: 2/25 & 3/25).}

The trenches in each pad i.e. grooves will be filled with oil, feeding from Crank holes flowing due to engine crank ration directed outwardly from centre. By centrifugal energy depending on parts-diameter due to its rotation. The grooves in a way contacting side-walls around each power wheel unit, for cooling as for Adiabatic. To provide perfect enthalpy system for each power wheel unit. The oil flow will reduce the heat of cylinders after fuel combustion. The pistons get their lubrication oil with the same principle, from a small tank (sump) in the base of each cylinder as intake store. That will be refilled always (if required by specific opening between the inlet

and outlet stores with excess length of its intake rod pump tunnel). The demand of lubrication oil for each piston will be supplied as its movement need. The piston will take sufficient lubrication oil by its lubrication pump fixed in its push-arm that sucks oil with any little movement ,supplying the piston needs. Then flowing and directed out side piston by out flow tunnel to outlet sump ,then far from wheel centre to wheel side wall .Then disposes it in the pad zone to be directed to Case by the same Centrifugal concept. The oil grooves and outlets for each pad to the Case as per the design. (Det. 10,11,15,17,28 Fig 2/25,3/25).

11./ {The valves of air-fuel mixture and pure-air are of the same shape, each on is in a separate short pipe device contains valves of a triangular wide back opposite to the air pressure supply direction moving in a same triangular or curved shape opening. It is guarded with spring. The place is in Case wall far away from firing zone to be directed at central of the wheel circumference surface and to be opened at the right time against chambers. They are controlled by rotation of cooling pad by a side of each power wheel, with a simple mechanical rod system connected with in the pas modified edge. There is a small smooth roller ended at rod that (which is oil saturated) attaching the pad edge for timing the opening by the main of lower (or upper) zone on the pad edge using this mechanism to transport he movement to valves. (Det- 20,21,22. Fig 4/25 & 7/25).}

The valves of air-fuel mixture and pure-air, air pipe-valves: are of same similar shape with mechanical control on the case. Each is in a separated short pipe device contains valve of a triangular with a wide back opposite to the air pressure supply direction. A triangular or curved shape against each wheel circumference in the case opposite to a same smaller graded shape opening. It is guarded by a spring. The place is in Case wall in a sufficient distance before firing zone for feeding chambers directed at central of the wheel circumference surface and to be opened at the right time against the chambers. They are controlled by the rotation of cooling pad(s) in a side of each power wheel. A simple mechanical elastic rod system connected within the cooling pad modified edge. There is a small smooth roller on rod end that (which is oil saturated) attaching the pad differential edge for timing the opening. By the meaning of lower (or upper) zones on the pad edge using this mechanism to transport and controls the opening movement to valves. (Det. 20,21,22. Fig 4/25 & 7/25).

{The air-fuel mixture valve is to supply and charging the air-fuel mix to chamber. The pure-air valve is to supply the fast (pressured) to chamber for cooling and scavenging the after burn gases in chamber by pure air. The two valves in each wheel charged consecutively with pressured air by one device to their two pipes from the same resource (pressured air cylinder or centrifugal turbine) which connected with engine rotation. The principle of distributing the air between the two pipes for chambers i.e. the different angles (i.e. different timing), maintaining the required pressure for both air-fuel mixture and pure air (scavenging on chamber) at various speeds. The controlling requirement could be by using out let opening regulator of pressure release of main air supply (i.e. a reducing of that opening in higher speed mean more pressure to engine). Using a device before air enters the two pipes. The fuel would be splash at required mix or various rate (as required) to charge the pressured air with fuel then to supply the chambers before power firing stroke. This has done by a simple device with needle valve(s) or sub carburettor or with additional mechanical or electrical computerised system as indirect injection (pre-mixing in the pipes or sub-chamber for each).}

The air-fuel mixture valve is to supply and feeding the air-fuel mix to a chamber.

The pure-air valve is to puff the air to a chamber while still opened for cooling and expelling the exhaust gases from chamber for air exchanging mission.

The two valves in each wheel charged consecutively with pressured air by one device into their pipes from the same resource i.e. pressured air cylinder or centrifugal turbine powered by compressor or by engine rotation as it needs.

The principle of distributing the air between the two pipes for chambers, its differential angles (i.e. different timing), maintaining the required pressure for both air-fuel mixture and puffing on a chamber(or adjusted) at various speeds. The controlling requirement done by using outlet opening regulator of pressure release for main air supply(i.e. a reducing of that opening in higher speed means more pressure to engine) by using this before air enters the two pipes. The fuel will be splashed at exact mixture or various rate (as required) to charge the pre-compressed air directed to ignition with fuel in order to supply the chambers with fuel mixture before firing it inside chambers in fire strokes.

The fuel splashed could be done by a simple spraying device of a needle valve(s) or a simple sub- carburettor or by mechanical or electrical computerised system as

indirect injection as pre-mixed air-fuel mixture in feeding the engine or in sub-store for each chamber (or direct injection at feeding zone on the wheel).

12./ {The ball bearing fixed in engine Case for holding Crank by connects it with Case from two sides (Det – 27 Fig 2/25 & 3/25).}

The ball-bearings fixed in engine Case for holding the Crank by connecting it with Case from two end sides or more . (Det. 27 Fig 2/25 & 3/25).

13./ { Water pump as known in the front side of engine (or out of engine) with its outer radiator pipes, with Case water cooling system tunnels (canals) to cool returning hot oil and all Case. (Det – 23 Fig 2/25, 3/25) if required or using air cooling system.}

Water pump is as known in the front side of engine (or out of engine) with its outer radiator and pipes, with Case water cooling system tunnels (canals) to cool the returning hot oil and all engine Case. (Det. 23 Fig 2/25, 3/25).

The air cooling system could be used instead of water with required tunnels or wings on the Case reinforced by air turbine to discharge air towards the Case.

14./ {The exhaust opening in Case starting a small with graded increasing in the direction of rotation in a special aerodynamic design in order to make the escape gases at exhaust stroke tool penetration position rapidly in a way produces a potential power reaction on wheel act on the same direction of rotation.}

The exhaust opening is in the Case for each wheel : starting with a small graded increasing in opening with direction of rotation in a special aerodynamic angles ,meaning specific wings designed in the outlet of exhaust pipe in order to make the escaped gases at exhaust stroke take penetration position in a perfect way to produce a potential aerodynamic reaction on the wheel to act on the same direction of rotation depending on escaping balloon concept on chambers.

{The principle used is the reverse of flying principle which used the fast air produced by plane fan to produce fast air on air-plane to fly, in this design an assumption of fixed fan (the exhaust special opening) will be under fast air reaction (the combustion resultant gases, under pressure) the wheel free to move (as plane) i.e. wheel will be under reaction of an excess potential power to rotate it, assuming Case moved in related to wheel put really the wheel moves, in reversing situation. This opening connected strongly with the exhaust pipe for each wheel then connected with the main exhaust pipe, and its angle depend o calculations of various data. (Det - Fig 4/25)}

The principle used here is to reverse the flying principle which utilising the fast air produced by plane fan to produce fast air turbulence on the air-plane wings to fly. In this design an assumption of a fixed fan (the exhaust specific opening) will be under fast air reaction (the exhaust gases, under its pressure and due to piston elastic depressed push-arm). The wheel is free to move (as air plane) i.e. wheel will be under reaction of an excess potential power to be rotated, assuming Case moved in relation to wheel put really the wheel moves, in reversing situation. This specific opening connected strongly with the case and exhaust pipe for each wheel then connected with the main exhaust pipe and could be moveable mechanically for changing its specification and angle depending on various calculations of engine data. (Det. 30, Fig 4/25).

15./ { Ignition distributor as known, put the number of contact points is twice the number of power wheel units (depends on cylinder No,(s) i.e. a triple for three cylinders in a wheel) with the same distribution angle for the whole wheel connected together by one cable and one spark plug for each power wheel unit. The rotating conductor could be (here) two opposite points contact every time. (Det-28 Fig 3/25).

The ignition distribution connected with the crank in a suitable place as rotates by the crankshaft. For engine of one large wheel with many pistons (cylinders), an ordinary one- point contacted, same angle distribution, using one cable i.e. ignition could be used easily.}

Ignition distributor as known, put any contact point has two contact points against each other for each wheel on the circular distributor, as the number of pistons in each power wheel units (depends on piston/cylinder No i.e. a triple in equal angle if a wheel has three cylinders and so on) . Using the same angle distribution for the pistons in whole wheels each one connected by one cable to its spark plug. The rotating conductor could be (here) faced each contact point twice per one cycle to spark two chambers every one cycle. (Det. 33 Fig 3/25).

The ignition distributor could be placed and mounted in a suitable place to rotate by pinion device with the required relation of engine Crank rotation.

For engine of one large wheel with many pistons (cylinders), by using usual one contact point, with the same angle distribution, using one cable for each plug as two for dual ignition and so on , and could be used easily.

16./ The accessories & sub devices :

{ A cylinder for compressed air with compressor pump, this is working with the engine rotation by a belt. A centrifugal turbine fan directly connected with Crank could be used to supply the pressured air. The charging air supplying both air-fuel mix and pure air for the chambers. A mechanical / electrical controlling device of air pressure connected with the accelerator pedal of the driver,

(a better performance than ordinary turbo charger although a better modified turbo charger could be used that depending on turbine and pre-heated and compressed by exhaust gases speed and heat but not in the same efficiency).

A cylinder stores relative compressed air with a compressor pump for recharging working with the engine rotation by a belt, to feed the engine with pre-compressed air. If a compressor in a vehicle could pump its tyre with the required pressure, why not using this method to charge pre-compressed mixture to this advanced compact engine !. A centrifugal turbine fan connected directly with Crank could be used to supply the pressured air to this cylinder. This cylinder should have a sufficient air pressure before the first engine performance. The charging air supplement to both air-fuel mix and pure air for the chambers, the types of air temperature could be controlled. A mechanical and/or electrical controlling device for air pressure, connected with the accelerator pedal of the driver cabin. A modified turbo charger may be used instead which is depending on pre-heated and compressed by exhaust gases speed and heat but it may be not working in the same perfect efficiency for this system which needs pre-compressed mixture. { The fuel spray injection instrument device to splash it in compressed air using the simple natural spray principle of a liquid (i.e. acclimatisation) depending on volatile of the opening and the specific density. This is the indirect injection way of charging the air while still in its way to chambers, maintaining idle (slow engine workability) by electric needle valves works with ignition by electric device. This suit for any kinds of fuel, a mechanically or electrically device system, can be supplied as one unit for all engine chamber requirements since its one pressure control accelerator. }

The fuel spray injection device instrument to splash it in the compressed air using the simple natural spray principle on a liquid (i.e. the acclimatisation), depending on volatile of the opening and the specific density of fuel. This is the indirect injection way of engine charging of air while still in its way to chambers. Maintaining idle (very slow engine workability) by electric needle valves works with ignition by electric device. In this way any kind of fuel octane could be used since the flexible

push-arms are used also. A mechanical or electrical device system, can be used as one unit for all chambers requirements since it is using same air pressure controlled by a simple accelerator pedal from driver cabin .{ A separate pipe-opening regulator for each wheel unit fuel valves requirement with a use of controlling system for automatic engine.(or using independent fuel injection on supplying pipe near each chamber valve)

(or using direct chamber fuel injection with its device for each wheel, fixed in Case).
Air for charging mixture would be pre-heated using device with electrical heater or utilising emission heat by attached to exhaust gases pipes.}

A separate pipe-opening regulator for fuel-mix valves in each wheel unit requirement, is in using the controlling system for automatic engine(or using independent fuel injection on supplying pipe or a store in each feeding valve), (or using direct chamber fuel injection with its device for each wheel, fixed in the case, as this could be more complicated devices connecting on the case).

The charging air could be pre-heated using a device with electrical heater or utilising the exhaust emission heat by attached device within the exhaust pipes.

{Fuel pipes and fuel pump & Charging (compressed) air pipes bearing the required pressure , (Fig 22/25 & 23/25)}

The charging compressed air pipes should bear the maximum required pressure for engine application with a safety factor. (Fig 21/25 & 22/25 & 23/25)

17./ { The compositions 's fixing set up (assembling method) is starting with the crank carrying all the wheels and pads to be pressed together as the required angles, places for parts and fixing required the circular seals on the wheels and trinket in groove on two parts of Case then other accessories. }

The assembling method (compositions set up) is starting with the main crank mounting on its all ready wheels and their pads by pressed together on it as the required angles. Placing other parts and required circular seals on the wheels and fix them in the grooves of Case parts then coming other accessories.

{ NOTES /

1. Since this is a new system, I tried to use a simple English language, with some data of conventional systems components names, however these names (as specified) are not necessary the standard names of parts in this system.

These names may be changed in the development process according to the final proposals and the their relevant industrial standard names, later...

2. All the discussions as for the enclosure drawings which are the references that declare all the compositions typically using Autocad computer programs drawings. (Drawings details are the liable references).
3. Enclosure the typical drawings set of 25 (twenty five) pieces. }

{{ the following article was changed in place to be after engine performance}}

{ USEFUL INDUSTRIAL AND COMMERCIAL CHARACTERS

1. A simple – easy to manufacture and less components parts.
2. High output related to the size and cost, a system contains pistons with rotary operating using exhaust gases aerodynamic potential power advantage.
3. Using a new principle in charging (i.e. compressed air-fuel) the air-fuel mixture to the chamber from out side with any pressure needed for the required performance, not as the old principles which suck the air-fuel mixture to the chamber and compact it to be in pressured situation by the same piston. This means using of a jet technique in charging fuel, in this design which will give high performance as fast better fuel burning as fast rotation engine needs and in relation-with other specifications; it would be very practical system.
4. The pistons in this engine connected with a flexible push-arm (flexible shaft bar) working as elastic resistance using various resistance, depending on the power data. Occur in the chamber at firing stroke, (types depending on fuel and output design). This character will apply good specifications, one of them is in reducing the sudden impact and will uniform stress of high power if occur on piston(s), in away that the arm resistance will transfer stresses on pistons uniformly on crank i.e. making the engine more smooth, reducing vibration. The elastic flexible piston depressing will allow a good flame propagation (as automatically controlled of combustion chamber space), and the same reason to prevent detonation in chamber.

The other advantage is to store some of it (the stress) toggled use of it later (it will charge the piston elastic resistance) to use it in the same purpose i.e. transfers it later too positive reaction. The design will use the stand-still locket gases accrued due to fuel combustion against the piston (in chamber); in away using the stored energy again to use it in the same direction (this happen fast, increase in high speed). The very next situation where the pressured gases (as stored energy) start to penetrate and release free out (in exhaust stork), from the

exhaust modified opening; the charged resistance add an extra power on penetrating gases as it starts returning to its first stag; a potential aerodynamic power exist by reversing this power with the elastic assistance of modified exhaust opening, (counter the theory of fly principle as aerodynamic reaction).

The aerodynamic power of the penetration of the chamber's pressured gases from graded specific opening of exhaust; will act against the wheel.

Those analysis conclusions could be confirmed in specialised industrial laboratory using physics, mathematics principles.

These potential powers would act as positive summation resultant reacting on piston causing more power added to combustion gases pressure in chamber to react on piston as additional power effect on wheel rotation.

The centrifugal natural power reacts on pistons (cup) as hunger in the circular zone of rotating wheel; will produce other reaction in high speed.

The potential invisible power could be used with other analysis to minimise the fuel consumption by reaching a special situation between high rotation speed and depressing of piston in combustion instance, using the required resistance and the relations of speed with dimensions and a computer device analysing these criteria's (Fig 18/25).

The natural heat energy advantage (if used) would tight the flexible push-arm of pistons with heat increase especially in using gas, hydraulic resistance, which (expands!) reducing the elastic movement of pistons (increase the resistance) i.e. reduce the sufficient capacity of charging air-fuel mix for the same output later with continuos working time. This special design will agitate (at fuel combustion) this physical nature's powers to appear in a situation magnifying the (best) fuel output power in this engine.

5. The lubrication in large part of it depends on a natural constant principle with a special design that the oil flow will increase with the speed increasing naturally not mechanically (as for conventional engines), it done by a huge centrifugal of the pads by feeding parts inlet oil holes from central tunnel in Crank as with relations to its distance from oil tank at Crank magnifying with speed increase, cooling the wheels and lubricating the pistons. This characters will lead to use the far pad as main oil pump by it special trenches, sucking oil from Crank to supply oil in Case for those seal masses and cooling Case needs in a best way.

The ordinary oil pump could be concealed if the oil tunnels of case terminate at feeding oil tank of the Crank canal.

6. The pistons with its flexibility arms will reduce the reciprocated movement with minimise descending, (in distance between upper and lower piston's dead point); du to increasing of the engine speed, due to the design, in a matter (counters to conventional system's principle-at high speed!); reduce vibrations of the main engine parts movements while increasing speed. The relation of push-arm depressing speed (time) with a rotation speed of the wheel in increasing engine's speed would lead to the equilibrium situation (as assumption) in very fast speed, it is a criteria of reducing chamber expanding combustion space for fuel at explosion; decreasing with speed increasing!

It is the miracle of the circular shape where the centrifugal powers exist in engine.

This is a very important character and would be utilised for reducing fuel consumption while increasing speed, using computerised advanced accessories.

7. This engine system does not contains those valves that used in the old engine with their timing articulated connecting system, (camshaft, tapping springs....etc); that valves with its mechanism however will limit the high speed of the engine, which need complicated frictional slippers and accessories as timings systems, which may fail in high speed, as for the modern engines with more valves number for a piston. Those are not existing in this system i.e. delete their problems, noises and air smoke related with any of their defect, although delete their failure which may happen in high speed.
8. The fuel air mix can be controlled easy in this engine form out side accessories, in two way by controlling the supplying pressure and also by controlling the fuel mixture, or both together, since the system doesn't required the same fuel compression ratio in all wheel chambers or in all its working situations with the independent characteristic of pistons performance and the independent units performance and the flexibility in the engine. Different types of fuel, any gasoline (Benzene)octane with a regulator for fuel splash charger. Jet gasoline or (gas) can be easy used in this system after reconsidering the accessories.
9. Cooling and cleaning of the chambers by outside pressured air (scavenging) directly after hot gases exhausted (stroke). This will control the heat of piston capping and supply perfect adiabatic efficiency of air (heat loss) system for

pistons in addition to the wheel side-walls oil cooling (enthalpy) of cylinder bore. The air also will prevent the remain of after burning carbon (soot) and will complete oxidise un-burned fuel and carbon oxide gas (CO) to complete oxidation it directly to (CO₂), same for nitrite oxide (NO), and SO if exist, this is a very practical way in anti-pollution system's treatment, in away to help conserve the good environment and atmospheric ozone and to help prevent acid rain.

When there is no sufficient way or time for cleaning the exhaust gases from the chamber in very high speed, it is possible to make the control system to delay the ignition for each dual high speed revolution, without big problem.

10. There is a new way of lubrication for the pistons that only the moving one will be lubricate when it needs to, as each piston has it's own oil pump, and the lubrication system in away that can reduce too much the pollution of air-oil smoke, since no crank case sump bellow the pistons, however no leakage gas affliction on oil sump if this happen.

There would be an air pad(s) under the piston(s) that could use it's advantage in a special piston design to maintain an almost equal pressure in high temperature in the two sides of piston i.e. on it's seals to be utilisedfor longer maintenance period and for output.

11. The distribution of piston (cylinder) angles against the crank C. L. in the engine will not need a balance weight which existing in recent engine, and their metal bearing (begins) pads on crank shaft for stress points lubrications to reduce friction on crank shaft which affected obviously in that system by high speed, those are not required in this engine system: The way of emission gases exhausted with the rotation direction will minimise the stress on seal mass, helping the good lubrication for seals.
12. This new design in distribution of pistons with a unique way in free movements of piston with the rotation of the main shaft (torque crank shaft), since the principle used here – will not need to distribute the stress for every combustion (piston) unit, as for the other; all working time, like what happen in the old system which all connected with the crank shaft; each one with (special angle) in slipping point guarded with metal bearing pads, thus all the combustion pistons will move consecutively (mutual) equal in side the cylinders due to the rotation of the crank shaft, all the time, and will increase with speed ascending causing much friction,

lubrication, heat and vibration, which affect the engine efficiency. This new design system reduces piston movement (descending) with increasing of speed rotations; due to spring flexibility (elastic) system reducing: the friction, heat, vibrations noise and, even it can reduce the fuel consumption. Using very advanced controller systems from outside depending on the harmony, hydraulic movement of pistons which will reduce in high speed.

13. The best seen character for this engine is the multi-output powers which can be changed in various ranges not even depending on the rotation speed of the engine but on the working parts inside the engine (automatically power output). Like for example all parts in used supplying 100% output of the engine for heavy work in a car engine, or 2/3 or less of parts in used for high speed or 1/3 or less of parts in used for just to keep the engine in Ideal working situation, this could be done in away that even its services (for un-used wheel); could be stopped. This character is very useful: in fuel consumption, in reducing pollution, in long maintenance, this new engine can be produced as engine for every work (multi-purpose) in one equipment (i.e. one car) which an automatically control the output as required, without affecting on un-used parts or make tough vibration. SHIRWO Automatically Need engine will be called Shirw a.n ...(SHIRWAN) system {rotary wheel automatic need}.

The transmission gear complex in this engine would be minimised.

14. Since there is the ability of stopping some of piston's movements (or all) in this design with the continue of rotation of the crank, the engine can be combined with an electric power engine in the same crank in an advanced design with a very practical use (fuel combustion engine and electric power engine in one unit set) depending on the simplicity design and minimum torque loss of this new engine which can charge the electric battery when the combustion engine working, and can use the electric power engine directly instead – if it needs; at required situations as needs in a crowded city, to reduce the pollution.
15. In addition to other characters and proposals which can be obtained in industrial laboratories this machine will fill the gap between the normal pistons combustion engine – and turbine Jet engine using their-all-good characteristics together in one engine, it will use the good characters of combustion piston (rotary) engine in economic fuel consumption, slow rotation speed if required, small engine and easy to manufacture and maintenance, with the Jet characteristics of high

power, high rotation speed if required using the aerodynamic power of exhaust gas with other potential powers; in an advanced designed and cheap engine unit.

16. This design will open the wide gate for computer participation in controlling all the activities and performance characteristics using advanced controller's accessories in this system at the near future. The speedy efficiency of the this engine and its good characters, which will give this engine a great economic influence.

The very important characteristic of reducing(decreasing) fuel consumption rapidly with speed increase .The analysis will leads to use it mainly in high speed that causing less reciprocating piston movement in engine, which makes it very qualified engines for Hoover Craft or flying equipment. A promising generation of combustion system will appear in the 21st century, to be used in advanced small Hoover craft (or a composite vehicle of it with Automobile)by implying this system for a cheap advanced computer controlled -running and flying-transportation equipment.

more advanced research on it will continue, for an example the Laser ignition may be used in its ignition due to its high speed!

17. The fabrication of the extensive and various options of this engine design could be implied easily when utilising the main parts of this system from those elastic devices springs or else used in the automatic emission of weapon re-fill in the different machine-gun and fast-cannons ,i.e. those weapon industries could transfer a good part of their production to participate in produce these engines for peace purpose....!. } { The whole previous article had been place changed }

THE ENGINE OUTPUT POWER TYPICAL PERFORMANCE :

{ As for (drawing) Fig 19/25

1. The engine starts to rotate by a starter motor-accessory fixed near an end side of the engine, by a starter switch for few seconds.}

As for (Fig 4/25, 5/25, 6/25, 7/25, 8/25 , 9/25 ,10 /25 and Fig 18/25 & 19/25) .

1. The engine starts to rotate by a starter motor-accessory fixed near an end side of the engine, by a starter switch for few seconds.
2. {All the inside parts will rotate, the valves start its work due to the automatic system of controlling its gate opening a giants each chamber in power unit wheels feeding the air-fuel mix, controlled by accelerator of driver pedal and its normal (idle)

minimum working feeder; to the first chamber by opened the valve gate at the same time with the timing duration's of the cooling (lubrication) pads by its connected taping bar. The air fuel mix will enter the first chamber over the piston and the continuing of rotate will take this chamber filled with (compressed) air fuel mix in a place opposite the spark plug.

*(as suction stork in old system) ...here [fuel charging zone] }

All the inside parts will rotate, the valves start the work due to the automatic system of controlling the opening a giants each chamber in power unit wheels. Feeding the air-fuel mix, controlled by accelerator of driver pedal and its (idle) working feeding or a bit more ; to the certain chamber by opening its valve at the exact time with the programmed mechanism by its pad via connected taping bar, the air-fuel mix is compressed in chamber i.e. space over a piston, the continues rotation will make this chamber at a place opposite the spark plug. .(a comparison with Otto system !)

(as suction stroke) ... piston moves downward in (Otto system).

{fuel feeding-charging zone }... piston still without move herein (Shirwo S.)..

3. {The chamber will be filled with compressed air fuel mix that maintain in pressured situation since the chamber locked by Case wall and piston and gas mass seals from two sides in circular wheel surfaces back side Case wall.

The position of seal masses on wheel circumference will keep it locket.

When the chamber placed opposite to the spark plug, air-fuel mix instantaneously sparked by ignition timing distributor, and will explode to gases, due to fuel mix fast burning. A production gases which need to expand to their natural large volume, in closet space; causing high pressure power on surrounded walls and piston which has the flexibility of start moving depressing due to its special spring connector inside the cylinder base, causing stress on the spring in the best typical way, by power stress due to gasses to piston then depressing then charges energy to the spring (elastic) system.}

The chamber will be filled with pr-compressed air-fuel mix. that maintains in pressured situation since the chamber locked by Case wall and piston and radian seal-masses from two sides contacting circular wheel circumference coaxial with Case cavity, as designed radian position of seal masses for each wheel contacting its circular circumference will keep chambers mod in the required closed situation

When the chamber reaches the spark plug .The air-fuel mix sparks instantaneously by ignition timing distributor. It will explode to a large volume of gases then put off. A produced gases which need to expand to their natural large volume, but they are in closed chamber, causing high pressure power on surrounded walls and piston. Piston has the flexibility of start moving to be depressed inwardly due to its elastic push-arm connected beneath, to cylinder base, causing stress on this spring in the best typical way due to gasses pressure on piston then depressing it then charging energy to this elastic push-arm, (the following missions will happen rapidly).

{ *(firing stroke)...old system.....starting power stroke.

[firing stroke] in this systemstart power zone

When the piston stress the spring system, the spring will transfer a part of this stress to the cylinder base (wheel side), causing rotation of the wheel, and the rest of that stress on spring will be stored as charged resistance assist to magnify the rotation power later at beginning of the exhaust graded opening to maximise the aerodynamic reaction on wheel rotation (this is the power duty of spring elastic power system here).} *(firing stroke), piston moves downward, Enthalpy, starting power stroke (Otto)*.

{firing stroke}, piston moves inward , Enthalpy , starting power stroke (Shirwo S.).

When the piston depresses inwardly, the elastic push-arm will transfer a part of this stress to the cylinder base (wheel side), causing rotation of the wheel, depending on its capacity, the rest of this stress on spring will be stored as constant pressure with charged resistance of the piston push-arm to be used later on aerodynamic reaction of exhaust gases (this is one duty of the elastic push-arm here).

4. { Apart of stress on the cylinder base caused by spring on side of wheel centre will push the wheel to rotate depending on this part of reaction of gasses pressure in the chamber due to pressured air-fuel mix fast burn, which will happen in other unit in succession.

*(expansion power stroke).....with enthalpy (old system)

{expansion power stroke – 1st power zone).....with enthalpy (Shirwo system)

Thus the firing stork will finished by burning all the mix then put off; producing potential stored energy (as gases in high pressure) before reaching the last big seal mass which fixed in suitable designed place.....criteria.}

As part of reaction caused by push-arm acts on cylinder base on wheel centre-side will push the wheel to rotate by piston displacement as moves inwardly due to combustion gases emission keeping a constant pressure in the chamber. .

(power stroke) piston moves to constant displacement ...high Enthalpy (Otto)

{ power stroke -1st power zone)piston in variable dsplt., high Enthalpy, (Shirwo S.).

Since firing stork is happened and finished when explosion is previously burned all the air-fuel mix and has put off rapidly keeping chamber(s) extent space stand still in high constant pressure without flame before reaching the last exhaust seal mass.

5. {Due to the rotation of this (wheel), the chamber will reach the graded exhaust opening i.e. enlarging trench(s) with rotation direction, the already lifted gases which still in high pressure inside the chamber (as the piston in depressed position), new compound stresses in this place due to many potential powers take place.

* (moving up starting – exhaust stroke-end power stroke) lose power , with enthalpy [starting exhaust-return back release –2nd power zone] extra power ,with enthalpy.

Due to this rotation of the wheel, the chamber will cross exhaust seal reaches the opening of enlarging trenches which graded in the same rotation direction. The emission left gases which still in high pressure inside the chamber (as the piston is in depressed situation i.e. inward situation), will cause additional power effect on its wheel due to the rapid escaping of these gases from the chamber via exhaust pipe.

(exhaust stroke-end power stroke)piston moves up, Enthalpy... power loss,(Otto.)

{exhaust stroke-2nd power zone} piston release, Enthalpy, ..exhaust power, (S. S.)

6. {The compound stresses that all react positively on wheel rotation are }
 {1st in time of gases start to penetrate from the graded exhaust opening – and due to star loosing of gases pressure in chamber the already compressed spring system (elastic system) which has been charged (or partial) by stored energy already produced in chamber before; will start rapidly to return to it's first position (normal situation) pushing the piston upward again, that will push also the remaining gases still not manage to penetrate to escape faster this case will cause potential reactions on the wheel the spring system in getting it first loosing situation will react in two direction i.e. on cylinder base means on the wheel when gases start escape.....(spherical reaction) }

The additional stresses (invisible or indirect) which act positively on wheel are :

1st the stored energy of spring (resistance) will attempt to be free causing power on gases (against piston) in chamber and due to circular Case inside-wall (chamber back-wall), and the uniform pressured gas physical characteristic of chamber gas pad (still closed chamber while moving along circular wheel edge zone) that will counters the reaction; this potential force will be reacted positively on piston direction which will provide simultaneously additional continuity power to keep on rotating the wheel in the same direction .

{2nd the stored energy of spring (resistance) will attempt to be free causing power on gases (against piston) in chamber and due to circular Case back wall (chamber wall), and the uniform pressure gas physical character of chamber gas pad (still semi-locket chamber) that will counters the reaction; the potential resultant force will be the positive summation reacts of one direction on piston which is provide another additional power rotating the wheel in the same direction (spherical react).}

2nd at the time of gases start to penetrate from the graded exhaust opening and due to start losing of gases pressure in a chamber the present compressed elastic push-arm (for piston) which has been already charged inwardly due to fuel explosion in chamber before; will start rapidly to return to it's first position (normal situation) pushing the piston outwardly again, that will push also the remaining gases still not manage to totally penetrate to escape faster, this will cause potential reactions on the wheel by the elastic push-arm reaction to get its release situation , reacts in two direction i.e. on cylinder base means on the wheel and on outwardly piston, (to form additional reaction to rotate the wheel).

{ 3rd the locked pressured gases which start to penetrate when reach particular wide of exhaust graded opening will discharge fast cause Aerodynamic movement to put the chamber (i.e. cylinder i.e. wheel) in a place that all gases manage to escape faster which cause the wheel to get extra power for rotation by law of fast air principle (as the air plane flying principal put in reveses analysis).

* (upward dead point) reduce Enthalpy high degree Entropy with Body cooler only.
[release total power] reduce Enthalpy low degree Entropy with Air scavenging & Body cooler (end of power zone).

And so in this place the stress summation will affect on the wheel and this a semi opened position i.e. the effecting of stress on the parts (near by) will be

less since the explosion of the air fuel mix already finished before in a chamber alone far from valves.

Same operation will be happened with the nearest wheel chamber (by angle radian distance) consecutively and the rotation movement will continue.}

3rd the locked pressured gases which reach the exhaust zone, start to penetrate via exhaust graded opening and will be discharged fast causing Aerodynamic force to drive the chamber (i.e. cylinder) in a place that all gases manage to escape rapidly as escaping balloon concept (the flying concept in reverses way e.g. exhaust opening has wings seated in specific effective design and direction), which acts with more reaction on wheel (additional reaction). So :

(upward d. pt.)high Enthalpy, entropy by Body cooler only, power loss.. (Otto.)
 {release piston}, control Enthalpy degree, entropy by Air puffing & Body cooler
 more effective reaction on power (Shirwo S.).

A summation of stresses will effect on the wheel. and on this a semi-opened position, stresses effect on these parts or near by will be less since the explosion of the air-fuel mix has already finished before in the chamber alone far from any valve. Same operation will be happened with the nearest wheel chamber (by angle radian distance) consecutively and so on the rotation movement will continue.

7. { When the gases manage to escape with the rotate of the wheel. The chamber will reach at the end of the exhaust opening to the pure compressed air valve which opens due to the rotation of the cooling pad tapping timing bar; against the chamber, permits a fast pure air cleaning (pure air scavenging) the chamber from what left to the gases to exit before the chamber leave the exhaust opening totally in ending the tacking cases due to the remaining carbon optical which may occur after burning the fuel mix and this way of cleaning the chamber by air has a great effect in deducing the pollution of un-oxidised hot gases. After fuel mix burning to treat them while still heat and will minimise the creation of carbon oxide gas element. The pressure of this pureed air will exceed with rotation speed increase.

So the chamber will kept always in suitable temperature.

* (move downward dead point-suction stroke) high d. Entropy ..lose power due to friction {natural stage – air cooling, cleaning} ...low d. Entropy ...no power lose !!

* (move upward dead point-compression stroke) ...H.D. Entropy ...loss power.

End of power zone (shirwo engine)....lower entropy with air cooling, no power lose.

An example of one stroke in each half cycle (here) at each wheel bearing part (wheel zone!) on crankshaft. }

When the gases manage to escape with the rotation of the wheel, the chamber will reach at the end of the exhaust opening to the pure air puffing valve that opens due to the rotation and tapping of timing bar controlled by side pad against the chamber, to puff a fast pure air, cleaning (scavenging) the chamber from what left of the gases as exchanging operation (the emission by pure air) .To expel these gases before the chamber leaves the exhaust opening totally .This helps in ending the expected tacking due to the remaining carbon optical which may exist after burning the fuel mix .This way of cleaning the chamber by air has a great effect in deducing the pollution of un-oxidised gases. It is helping to treat them while still hot and will minimise the expected production of harmful premier oxide gases. The pressure of this air will exceed while rotation speed increase with adjustment to keep chamber always in a suitable temperature for engine situation by this new procedure .

(suction stroke) piston to downward d. pt. high Enthalpy, stroke& power lost (Otto.)

[natural stage – air puffing on chamber] control of Enthalpy no power loss (S. S.)

8. { In increasing speed of this system, the rotation radian velocity of the wheel would become near to equalise with pistons push-arm (resistance) depression's velocity, depending on the elastic resistance (push-arm) data character.

This means the expanding space of chamber will be deduced (for the said required engine power) by increasing speed, a mathematics criteria with fuel compression rate: speed, resistance depress, fuel, dimensions, will conclude to reduce fuel in increasing speed.

In high speed also, the reaction of the nature's centrifugal power will appear at combustion stroke (power stroke) stage, that acting on piston as its location being in the circumference of a rotating circle with freedom to be pushed out of it (in its moving zone) modifying the piston depressing resistant with potential power but due to gas pad in (loket chamber after combustion happened), although existence of Case circular back wall (chamber back wall); that keeping the chamber in radiance move maintaining the same uniform pressure in chamber (due to this design and seal places) this pressure with gas physical character that revoke (reflect) any power reaction on piston (fuel combustion energy is the mass movement of piston; Newton law) magnifying fuel combustion energy on engine i.e.

reducing the expanding of chamber to the said fuel, means reducing of engine fuel requirement for the said power in increasing speed i.e. a criteria of reducing fuel consumption in increasing speed. (Fig 19/25).

Then the rotation continues for the next stage to be for the comparison :

*(compression stroke) piston to upward dead pt., Enthalpy, loss power, old S.

(feeding -charging zone) control of Enthalpy, no power lose,.... Shirwo engine.

{The performance accessories which help this engine to work are:

(Fig21/25& 22/25),} {{ place changed after point 9 }}

- A. {A-The compressed air cylinder with its charging(compressor) motor that gets its rotation power from the engine by a belt which keeps the air in sufficient pressure. Discharging it to the main pipe which guarded by a controller regulator by secretor-bar from driving cabin which is always in closet state when engine out of work, electrically. To open when ignition starting with the slowly -run regulator. The open device to the pipes one for (fuel mix) to fuel spray for whole power wheel units or to separated fuel spray system for each power wheel unit to be electric controlled (computer system) from the driver cabin. The other pipe device for pure compressed air to the (cleaning) cooling air valve.}
- B. {The fuel spray system is a mechanical-electrical instrument device with needle valves which use a simple principle of letting the fast air passing on small outlet opening of fuel to crate spray in this air as required depending on Specific Density of fuel which maintain in supplied by ordinary fuel pump(mech. or elec.).}
- C. {The necessary pressured air will increase due to paddle-engine managing system controlling speed of engine's rotation and torque power.

The other accessories like oil pump and water pump and ignition distributor will rotate with the crank or as for the industrial design.

The overall work of power wheel units (all) output with a remarkable rotation speed or remarkable pressure for charging fuel will supply monitoring the output power of the engine, that could be modified by various criteria.}

9. In increasing the speed of this system, the radian rotation velocity of the wheel would become near to equalise a speed of pistons push-arm depression's velocity (resistance speed reaction),it is theoretical assumption depending on character data of this elastic push-arm, although the high speed will try to balance the wheel This means the expanding spaces of chambers will be deduced (for the said engine power) by increasing certain speed, a mathematical criteria with fuel

feeding rate: speed, resistant depress, dimensions, fuel and of course the loading on the engine will be concluded to reduce fuel feeding at increasing engine speed. In high speed also, the reaction of the nature's centrifugal power will appear at combustion stage then power zone to act on piston(s)(and its chambers) consecutively as located almost in circumference of a rotating circle, free to be pushed outwardly, by this centrifugal potential opposite power (i.e. piston and combustion gases in the chamber, as mass reaction under Newton law), but due to gas pad in a locket chamber (after combustion happened), and existence of Case circular back wall (chamber back wall); that keeping the chamber in constant radian move maintaining the same constant pressure in the chamber (due to this design and seal places). This pressured gases as gas physical characteristic will reflect as a balloon any power effect on it as opposite reaction of piston to counter it back again on piston(s), then wheel(s) magnifying fuel combustion reaction on engine. It is meaning of reducing the expanding of chamber in highly speed for the said power, means reducing of engine fuel requirement for the said speed i.e. a criteria for reducing fuel consumption while increasing speed. (Fig 19/25).

The accessories which help this engine to work are:

As shown in (Fig. 21/25 & Fig. 22/25).

- A. Cylinder for compressed air, this cylinder should be in a suitable air pressure by the manufacturer before engine start to performance only, then it will be charged automatically by the engine via a compressor which gets its rotation power from the engine itself by a belt which keeps the air in sufficient pressure. It is to discharge air to the main pipe which guarded by a regulator controlled by accelerator-bar from driving cabin which is always in closed status when engine out of work, electrically. To be opened when ignition starting with the slowly-run (idle) regulator. A device control the pipes outlets one for (air-fuel mix) to get fuel spray for whole power wheel units. Or to a separated fuel spray system for each power wheel unit, by electric control (computer system) from the driver cabin. The other pipe for pure air to be puffed on piston and its chambers at end its exhaust.
- B. The fuel spray system is a mechanical and/or electrical device with a needle valve which uses a simple principle of permitting fast air passing on small outlet opening of fuel to produce spray in this air as required depending on Specific Density of fuel which maintains in supplied by usual fuel pump(mech. or elect.).

C. The necessary pressured air will increase due to driver paddle-managing system controlling feeding then speed of engine's rotation and torque power.

D. The other accessories like oil pump and water pump and ignition distributor will rotate with the crank or as for the industrial design.

The overall work of power wheel units (as all) output with a remarkable rotation speed monitoring the ideal output of this engine could be changed not only by depending on increasing fuel discharge-pressure, it could depend also on other engine modifications for separating engine's part performance as auto-output.

CONCLUSION , of analysing additional potential energies :

{The maximum fuel power output that occur due to a larger piston moment on Crank, than that of recent system, with the effective angle of torque power more than 180 degree (depend on the design).

After the instance of fuel combustion in this mechanical design system, Physical power(s) will happen due to the particular distribution places of chambers with the utilisation of the physical character advantage of gas (under pressure chamber gases) that occurred after combustion, although utilise physical powers that happened in other particular places and situations.}

The maximum fuel power output that occurs due to a larger and longer pistons moment on the Crank, larger than recent existing systems, with the effective angle of torque power (could be more than 180 ° -depending on the design).

After the instance of fuel combustion in this mechanical design and according to the direct powers occur simultaneously at fuel combustion in this discipline which employed natural physical concept powers to happen due to the particular places of chambers and by utilisation physical characteristic advantage of gases under pressure in chambers those result due to fuel combustion, reactions appeared as:

1. { Under pressure gases impact on piston, the physical power of elastic character (flexible push-arm), would act on two ways, a part pressing the wheel to rotate, and other on piston to get back to its top point (upward dead point), due to the resistance of push-arm that already depressed by the piston i.e. chamber's combustion gases. It is gas physical character in I locked space, which could reverses (reflect) any force as elastic resistance to an opposite reaction which will be back again on piston. Since the back side of chamber was the case wall (internal circumference of circular wheel cavity), which is the only sway moving

smooth level with (constant fixed axes), chamber stills in locket situation by seals Job; while the wheel rotates means keeping locket chamber in fuel firing zone,. This is the appearance of hydraulic (spherical) reactions of chamber gases. There will be many advantages in utilising this chamber (gas pad) hydraulic characteristic in this mechanical system to invest all powers happen inside this system positively on engine Crank.}

The pressured gases impact on piston, the power reaction of elastic flexible push-arm, would act on two ways. A part pressing the wheel to rotate, and a part acts to get back to its previous mod at the piston top point (upward dead point), as it is elastic push-arm that will be stayed in charge beneath the piston, due to chamber's combustion gases. It is the gas physical characteristic in a closed space, which will resist any force as gas elastic resistance to reverses (reflect) this reaction appositely, which will be back again on piston and since the back side of chamber is the Case circular wall (internal circumference of circular case cavity), which provides away for keeping it moving smoothly (on constant fixed axis), keeping chambers in locket situation by the radian seals job, while the wheel rotates means keeping a lock chamber in power zone with constant pressure. This means keeping the longer impact effect of this power on Crank. This is the hydraulic reactions of chamber gases inside this engine & the spherical shape advantage in utilising the chamber pressured gas pad characteristics in this situation by consecutive investing of all physical powers effects happen inside this system to be concentrated on the chambers to be used positively on engine.

2. { A losing of pressure due to gases penetration when gases start to penetrate due wheel rotate reach the exhaust opening, will agitate the last static elastic physical power on elastic piston push-arm (after first dressing attending to return back rapidly to its normal position on two direction (sides) of reaction, meaning on wheel also to act with addition power for rotation.)

A losing of pressure due to gases penetration as gases start to penetrate when wheel chamber reaches the exhaust opening, will agitate the elastic charged piston push-arm (in static situation but depressed situation) attending to return back rapidly to its normal position, it reacts on two opposite directions (two sides), meaning on wheel and chamber gases to add more power on wheel for torque.

3. { After the instance with continue of that powers effect. A new physical power happen due to the way of exhaust opening's design that allow the under-pressure gases to extending partially then totally penetrating in away to get their fast best position of escaping from chamber. With the advantage of existing access power from the piston push-arm resistance being under press that attend to return to its normal (first) position. Physical power which is the Aerodynamic that forces the chamber to be at the right position (portion) when gas escape which will cause additional rotating power on the cylinder i.e. wheel to rotate depending on its place and on the exhaust opening place in this design. By the mean of using the same principal analysis mentioned, that produces aerodynamic power by using the air speed principle (a flying principle put in a reverse way of reaction analysis).}

After the continuity of wheel movement and those powers effect, a new physical power happens after this instance due to the way of exhaust wings opening's design. That allows the under-pressured gases to extend partially then totally penetrating in away to get their fast best position of escaping from chamber. With the advantage of existing access power from the piston push-arm resistant being under press that attend to return to its normal (first) position. A Physical power which is the Aerodynamic that forces the chamber to be at the right directed portion while gases escaping. Which will cause additional rotating power on the cylinder i.e. wheel to rotate depending on its place and on the exhaust opening place in this design. By the meaning of escaping balloon principle used here in this analysis. It produces aerodynamic power by using the effect of air speed concept (as flying concept put in a reverse way of reaction analysis).

4. In increasing of engine speed (i.e. rotation speed) a new physical power will appear, instantaneously at the time or fuel combustion.

The piston mass (cup) will be under the force of the physical Centrifugal principle due to its location in circular wheel and its mass-weight (even the mass of chamber gases), this means adding more potential power to the push-arm resistant. That will act on piston against fuel combustion power n chamber. This reaction which transpires to pressured gases which are in a locked space in the chamber but with the advantage of gases physical character being under pressure (after fuel combustion). The gas (referred to pressured gas character in

a closet space) will reverse (reflect) this power to be opposite to piston face (i.e. same depressing direction) adding additional power i.e. additional power on wheel. Those mains the said duel demands for this situation of engine speed; could be reduced rapidly while increasing speed. (Fig 18/25).

This with other criteria concerning the speed of push-arm depressing formula against the combustion force in a relation to wheel rotation speed which may reach theoretically equilibrium situation in very high speed, thus reducing the reciprocated movement of pistons while increasing engine speed.

That depends on type of fuel (after burning gases compression) and kind of the resistance used with a relation to centrifugal effect on that piston cap, all analysis concluded with the output and speed.

Mathematics conclusions for various design proposals reducing fuel consumption in increasing the speed could be reached. Using the advanced conclusion of beyond earth flying principal i.e. space technique of how to allow a space-ship to free from Earth gravity intensity zone by using the speed and centrifugal principle, this system uses this principle inside engine in a small sample but will reverse (counter) this principal, by reversing its force. The piston to be assumed (fixed) space-ship and the wheel as (Earth) while increasing its speed. It is free to rotate (more), and the re-product of gases under-pressure (due to fuel combustion) in chamber acting instantaneously as more power of gravity (of Earth), the reaction will reverse here to act positively again on the wheel. An advanced computerised controlling system using the conclusion of that calculations for a piston weight, a wheel diameter, type of piston push-arm resistance, fuel output, kind of equipment and speed; to set a controlling system for reducing the fuel by connecting it with the air-fuel charging accessories devices to control fuel as it required then reducing the consumption in increasing speed. This is the way of reducing the fuel consumption while increasing speed!

In increasing of the engine speed (i.e. revolution speed) physical powers will appear, instantaneously at the time of combustion and increased consecutively, with influences on the piston (chambers) performance and will effect in two ways. First , each piston which produces linear force to accelerate a revolution of a circular mass (the wheel), which is mounted therein. This will be under a physical effect depending on speed factor, due to this design. The reaction forces to accelerate the wheel revolution which is the linear depressing of the piston inside

a wheel will be reduced linearly since it could move freely due to its push-arm. That is the more speed in revolution does not need the same primer impact of linear force reacting all the time to keep the wheel revolution in a constant high speed or accelerated. This means a particular consecutive reduction in potential power of the piston (i.e. the fuel combustion needs) during highly speed, that will be required to produce these impact powers consecutively on wheel. This means the said fuel demand for highly speed situations of engine, could be reduced rapidly while reaching highly speeds and so on. This with other criteria concerning the distance of push-arm depressing formula against the combustion force. A relation to the wheel revolution speed and the decreasing of linear movement of the pistons while increasing this speed, which may reach to the minimum reciprocated linear force effect situation(minimum piston displacement) on the wheel in the highest speed . A physical concept implemented here on wheel's rotary dynamic speed and its acceleration and the linear (piston) force effect consecutively, to reduce these reactions due to speed effect in highly speed.

The other effect is by using the physical principle of how a space-ship is escaping from earth-gravity i.e. a technique which allows a space-ship fly free from Earth Gravity intensity zone by employing the centrifugal concept. This system employed this concept also inside the engine in a very small sample but in reverse reaction, by countering this force. The piston cup(piston top and gases mass in the chamber) is to be assumed as a mass with freely movement under the effect of speedy circular circumference zone (as a space-ship and the wheel as earth while increasing its speed). The more speed, the more force to let these masses try to escape from its central gravity in consequence reactions, the under-pressure gases happened instantaneously after fuel combustion in chambers will counter these reactions since the pressured gases in a closed space (the chamber) will reflect this outwardly centrifugal effect reacted from the piston back again to the wheel via the piston face itself by the gas physical characteristic being under pressure in the chamber(s) in a closed space to act like a balloon for reflecting any reaction, back on wheel which is the only free to rotate more as pivoted on crank of engine, adding this additional power to act positively on wheel again. All these influences connected with the physical

centrifugal concept employed here. Even the distribution of pistons in wheels and achieving the balanced situation at highly speed would be considered.

These reactions appeared due to employing physical concepts related with the circular shapes of members used in the discipline of this system, the resultant would be called additional spherical sustained reaction on the engine (Fig 18/25).

The mathematics analysis for all mentioned concepts could be achieved easily. A computer formatting calculations and conclusions for a piston weight, a wheel diameter, type of piston push-arm resistance, fuel output, the design and kind of application, the reduced spaces at increasing speeds, for achieving the required dimensions for each option. The graphical indicator diagram analysing deduction of chamber expansion at various speeds and its exact fuel need for the smallest expanded chamber reduced space, to be used in an advanced controlling system e.g. a computer to observe these potential effects with relation to each options to connected with feeding device to reduce actual fuel consumption at highly speed. These potential effects still neglected and lost in the conventional systems. This is the practical advanced way of reducing the fuel consumption in highly speeds by using this power system which is designed to use this criteria !.

IN GLOSSARY (Philosophy of utilising Physical Centrifugal technique) (Fig 18/25):
 {(Philosophy of this technique)}:

{ This system is utilising the theory, which used in charging water or any liquid by principal of a ""Centrifugal Pump or centrifugal copressor"" rotated by power supplied from other automotive resource . (Fig 18/25)

Using the same theory for mechanical design but in a counter way of reaction. Since the liquid used in place here is that charged with power charged liquid (easy chemical energy analyses) that is fuel spray form Petrol. Which is been used in a discipline that could produce energy force inside this system then making this energy act in a way (i.e. reverse direction on that centrifugal pump system) to make it rotate as automotive power engine, while using the same principle of reaction which is centrifugal (high speed reaction on a mass moving in a circular zone) to utilise this character on pistons-mass and assumed expanded gas mass) as for their particular circular-zone places in this system for producing torque power then could used in reducing the fuel needs for said speeds (that can be seen in high speed) while increasing speed! }

This system is utilising a theory, which used in charging water or air e.g. any liquid by a concept of a »Centrifugal Pump or centrifugal compressor« rotates by automotive power resource supplied from outside.

Using the same theory for this design but in a counter way of reaction. Since the liquid used here inside is replaced by a specific one containing potential energy, an easily analysed chemical energy liquid, that is the air-fuel mixture. Which is being used first in this discipline, to produce chemical energy force inside this system to use it for supplying system automotive power requirement. By making this energy acts in a way to make it rotates by an inside automotive power source. { The performance of the engine depends on many constant assumptions and the proposed observations of its work here without any mathematics figures since those information depend on the industrial specifications, laboratories calculations, kinds of allays, types of equipment, the capacity of output, fuel and accessories data.

For that reason the definitions are theoretically the principal of performance and could be practically proposed after monitoring the data in specialised industrial laboratories in order to reach the most economic design for each case and proposal.}

Then using the physical reactions appeared in this discipline which is similar to centrifugal pump, due to speed reactions on a mass located on a circular zone, to act on pistons-cup (mass of piston and combustion emission of expanded gases in chambers), which seated to be under this influence freely to be effected to be driven outwardly consecutively in the meaning of reducing the linear displacement of piston due to fuel combustion without losing its impact on the wheel, as relatively to their particular place on circular-zone in this system. This influence will react in a reverse direction in this discipline due to emission of pressured gas pad in chambers to act as elastic resistance as a balloon of gas in the chambers upon pistons to counter this influence to act back again on pistons which are already pushing their wheel(s) to rotate to be as physical additional resultant acting positively on pistons, i.e. engine consecutively at highly speed. In the meaning of using this new principle of centrifugal concept employed in automotive power discipline for the benefit of increasing engine output by using the reflection of inside centrifugal reaction, to use these as a criteria to increase output power of a said fuel or to increase acceleration rapidly or to reduce the

said consumption in this integral engine system. These invisible(or indirect) physical influenced reactions in additional to the exhaust physical aerodynamic effecting on combustion intensities are due to advantages of circular shape physical utilisation in this engine so it called (*The spherical sustained reaction*).
The performance of the engine depends on many constant concepts and the observation of its missions here are without mathematical equations. Since they should depend on assumptions of industrial laboratories calculations, dimensions types of alloys, types of output applications, fuel and accessories data, all these could be assumed and could be formatted by computer programs for each option.

{ Note:

Mathematics analyses might be done in specialised industrial laboratory at development process later using the recent requirement data available for proposals.}

NOTES/ 1./ Since this is a complete new system, the inventor tried to use the simple English words, with some names of components used in conventional engines, however these names (as specified) are not necessarily the actual standard names of these parts, they may change according to the developments.

2./ All the prescriptions and declarations as for the enclosure 25 drawings which are the references that declare all the compositions typically done by Auto-cad program drawing. (Drawings details are the reliable references before words).

SPECIFIC PROPOSALS :

1. { Light solid allows for power wheel unit might be reinforced by hard solid steel in torque stress places (i.e. middle panel of wheel, crank trunk hole between the cylinders, cylinder bases and wheel circumference as one alloy).}

Light solid alloys for power wheel unit might be reinforced by a hard solid alloy in high torque stress places (i.e. crank-wheel hole, middle panel of wheel between the cylinders, cylinder bases and modified wheel anti-scratch circumference).

2. {Light solid alloys for piston's disk as required.}

Light solid alloys for the piston's disk as the specific industrial requirements.

3. {The push-arm resistance capacity for piston must depend on type of: engine output, speed of acceleration, working output, type of design, dimensions...etc. The temperature resistance flexible metal spring system (i.e. that used in weapon

industries as for automatic artillery gun refill spring) or : hydraulic closed system (gas, oil) with heat resistance seals may all used for piston elastic push-arm.}

The push-arm resistance capacity for piston must depend on type of : engine output, acceleration, speed, application, type of design, fuel...etc. The flexible elastic system may be consisting simple metal spring (i.e. that used in weapon industries as for automatic fast canon refill spring). The hydraulic closed system could be used (i.e. of gas or oil) with the heat resistant seals may be used for the piston elastic push-arm. The metal spring could be in deferential circular diameter dimensions or even in its metal cross sections, for bearing different power ranges.

4. {For main gas seal mass: a self-lubricated Graphite alloy or hard metal alloy with special lubrication system in the engine case using the advantage of one direction wheel rotation with special trenches and holes, or advanced plastic solid combined material with anti-heat character; the type, shapes and sizes might be varied from different industrial resources; for minimum sufficient contact. Three types of seal mass, one for anti normal air, one for anti air-fuel mixture, one for anti-hot gases after combustion occurred before exhaust penetration. The same principal for all or use couple of seals for two-way efficiency i.e. opposite locket reaction in one seal mass unit. Wangle seal could be used in each seal mass unit i.e. not in rotary part here but in the case with more efficiency, workability since it used in fixed place (fixed axes) i.e. maintaining a fixed axial position for the wheel surface contact here.}

For radian gas seal mass: could use a self-lubricated Graphite(carbon) alloy or hard specific metal alloy with special lubrication system in the engine case using the advantage of one direction wheel rotation with special trenches and holes. Or specific plastic solid compound material with anti-heat characteristic, the type, shapes and sizes might be varied from different industrial resources, for minimum sufficient contact. Three types of seal mass, one for anti normal air, one for anti air-fuel mixture, one for anti-hot gases after combustion occurred before exhaust penetration. The same principal for all .Or use couple of seals for two-way effect i.e. opposite lock reaction in one seal mass unit. Wangle seal could be used in each seal mass unit i.e. not in rotary part here but in the case that provides more efficiency and workability since they will be used in a fixed place acting on a fixed

axis maintaining a constant axial positions for contacting wheel circumference surfaces which fixed on one constant axis in this system (not parabolic rotation!).

5. { The big circular seals & wheel with Case sliding are of three or more stainless steel ring bladder inter lock gathered as a slide bearing ring device or couple as industrial required or special wheel's edges with sharp design inter lock with engine Case; with a technique for anti-oil-gas penetration when combustion happen depend on design proposals (Fig 2/25 & 3/25). }

The big circular seals between Case and wheel for sliding and anti-penetration, are of couple three or more stainless steel ring bladder inter-lock gathered as a slide bearing ring device or as industrial required. Or by special wheel's edges with sharp design to inter lock with engine Case, a specific technique as required to reserve the mod on wheel depending on design proposals. (Fig 2/25 & 3/25).

6. { Oil, gas, rings seals in pistons as specified metals for this work. }

Oil, gas, ring seals in pistons are by using the specified required alloys.

7. Lubrication pads light aluminium alloy with special radius grooves for oil cooling and special smooth hard alloy smooth edge for controlling timing of valves-bars with chambers positions, the timing regulation for each valve in one pad or each in a pad, the timing depends on the design data & requirements.

The oil pads are of light aluminium circular plate alloy with special radius grooves for oil cooling with smooth hard specified alloy edge for controlling timing of valves-bars with chambers positions, the timing control for the two valves in one pad or each in a pad, the timing depends on the design data and other requirements.

8. Oil is used for lubrication & cooling the power wheel units this oil could be cooled by water or air cooling system in the engine unit or out side.

Oil is used for lubrication & cooling the power wheel units, this oil could be cooled by water or air cooling sub-system in the engine case or out side the engine.

9. The distributions of cooling water groves in Case are as for industrial design for cooling Case and oil.

The distributions of oil and cooling water grooves in the Case are as for industrial design of the Case to cool the engine returning oil in the Case and the engine.

USEFUL INDUSTRIAL COMMERCIAL CHARACTERISTICS{Article place changed }

1. A simple – easy to manufacture and less components parts.
for the final products.
2. High output related to the size and cost, a system contains pistons with rotary operating using exhaust gases aerodynamic potential power.
and other potential power advantages.
3. { Using a new principle in charging (i.e. compressed air-fuel) the air-fuel mixture to the chamber from out side with any pressure needed for the required performance, not as the old principles which suck the air-fuel mixture to the chamber and compact it to be in pressured situation by the same piston. This means using of a jet technique in charging fuel, in this design which will give high performance as fast better fuel burning as fast rotation engine needs and in relation-with other specifications; it would be very practical system.}
Using a new principle in charging the air-fuel mixture to the chambers, i.e. pre-compressed air-fuel mixture, from out side with any pressure needed for the required performance, not as the old principles which sucking the air-fuel mixture to the chamber and compressing it to be in pressured situation by the same piston with its way of losing power stroke and energy and relative slow acceleration . This means using of a jet technique in charging fuel, in this design which will give high performance as fast and better fuel burning as fast acceleration engine needs without limits related to other specifications.
4. The pistons in this engine connected with a flexible push-arm (flexible shaft bar) working as elastic resistance using various resistance, depending on the power data. Occur in the chamber at firing stroke, (types depending on fuel and output design). This character will apply good specifications, one of them is in reducing the sudden impact and will uniform stress of high power if occur on piston(s), in away that the arm resistance will transfer stresses on pistons uniformly on crank i.e. making the engine more smooth, reducing vibration. The elastic flexible piston depressing will allow a good flame propagation (as automatically controlled of combustion chamber space), and the same reason to prevent detonation in chamber.

The other advantage is to store some of it (the stress) toggled use of it later (it will charge the piston elastic resistance) to use it in the same purpose i.e. transfers it later too positive reaction. The design will use the stand-still locket gases accrued due to fuel combustion against the piston (in chamber); in away using

the stored energy again to use it in the same direction (this happens fast, increase in high speed). The very next situation where the pressured gases (as stored energy) start to penetrate and release free out (in exhaust stroke), from the exhaust modified opening; the charged resistance adds an extra power on penetrating gases as it starts returning to its first stage; a potential aerodynamic power exists by reversing this power with the elastic assistance of modified exhaust opening, (counter the theory of fly principle as aerodynamic reaction).

The pistons in this engine connected with a relevant free flexible push-arm working as elastic resistance, using various resistant types depending on the engine design and power data occurs in the chamber at firing stroke, (types depending on fuel and design). This characteristic will apply good specifications, one of them is in reducing the sudden impact and will uniform stress of high power if occur on any piston(s). In away that these push-arms will transfer stresses of pistons uniformly on the Crank i.e. making the engine more smooth, reducing the vibration. The elastic flexible piston depressing will allow a good flame propagation (as combustion chamber space is automatically controlled), and the same reason to prevent detonation in chambers.

The other advantage is to store some of it (the stress) to get use of it later (it will charge the piston elastic resistant). To use it in the same purpose i.e. transfers it later to positive reaction. The design will use the stand-still locked gases occurred due to fuel combustion upon the piston (in chamber); in away using the stored energy again to use it in the same direction (this happens fast, increases in high speed). The very next situation where the pressured gases (as stored energy) start to penetrate and release out (in exhaust stroke), from the exhaust modified opening. The charged resistant push-arm adds extra power on penetrating gases as it starts returning to its regular form, more potential aerodynamic power exists by reversing this power with the elastic assistance via specified exhaust opening, (countering the theory of atmospheric flying principle as aerodynamic reaction).

The aerodynamic power of the penetration of the chamber's pressured gases from graded specific opening of exhaust; will act against the wheel.

Those analysis conclusions could be confirmed in specialised industrial laboratory using physics, mathematics principles.

These potential powers would act as positive summation resultant reacting on piston causing more power added to combustion gases pressure in chamber to react on piston as additional power effect on wheel rotation.

The centrifugal natural power reacts on pistons (cup) as hunger in the circular zone of rotating wheel; will produce other reaction in high speed.

The potential invisible power could be used with other analysis to minimise the fuel consumption by reaching a special situation between high rotation speed and depressing of piston in combustion instance, using the required resistance and the relations of speed with dimensions and a computer device analysing these criteria's (Fig 18/25).

The aerodynamic power of the penetration of the chamber's pressured gases from graded specific opening of exhaust; will act with more power on the wheel.

The analysis and conclusions could be confirmed by a sophisticated industrial laboratory using physics concepts and relative mathematics equations.

These potential powers would act as a positive summation resultant reacting on piston causing more power added to fuel combustion pressure in chamber that reacts on piston as additional power effects on wheel to increase engine output.

The centrifugal natural power, reacts on free pistons (cup) since they are placed in the circular zone of rotating wheel ; to produce other reactions in high speed.

These potential invisible reactions would be used with other analyses to minimise the fuel consumption by reaching an assumption situation between highly revolution speeds and depressing of piston(s) due fuel combustion instance, using data of push-arm resistance and relations of speed with dimensions and fuel, a computer formatting device analysing these criteria for each option, (Fig 18/25).

The natural heat energy advantage (if used) would tight the flexible push-arm of pistons with heat increase especially in using gas, hydraulic resistance, which (expands!) reducing the elastic movement of pistons (increase the resistance) i.e. reduce the sufficient capacity of charging air-fuel mix for the same output later with continuous working time. This special design will agitate (at fuel combustion) this physical nature's powers to appear in a situation magnifying the (best) fuel output power in this engine.

The heat energy advantage (if used) would tight the flexible push-arm of pistons with heat increase especially in using a gas, hydraulic resistance, which could

reduce the elastic movement of pistons (increase the resistance). It means reducing the sufficient capacity of charging air-fuel mix for the same output later with the continues of working time. This special design will agitate (at fuel combustion) these physical nature's powers to appear in a situation could magnify fuel output to be in the best potential power related with speed in this engine.

5. The lubrication in large part of it depends on a natural constant principle with a special design that the oil flow will increase with the speed increasing naturally not mechanically (as for conventional engines), it done by a huge centrifugal of the pads by feeding parts inlet oil holes from central tunnel in Crank as with relations to its distance from oil tank at Crank magnifying with speed increase, cooling the wheels and lubricating the pistons. This characters will lead to use the far pad as main oil pump by it special trenches, sucking oil from Crank to supply oil in Case for those seal masses and cooling Case needs in a best way.

The ordinary oil pump could be concealed if the oil tunnels of case terminate at feeding oil tank of the Crank canal.

The oil services mainly depends on a natural constant principal with a special design that the oil flow will increase with the speed increase naturally not mechanically (as for conventional engines). This will be done by a centrifugal concept depending on the pads designed groove by feeding from central tunnel in Crank via relevant holes with relation to its distance from oil tank in engine. Magnified with speed increase, cooling the wheels and disposing pistons oil. This characteristic will lead to use the far pad in crank as huge oil pump by using high hydraulic specific grooves(trenches), for sucking oil from Crank to supply oil in Case for those seal masses needs and to cool Case in a best way. The usual oil pump could be cancelled if the oil tunnels in the case terminate at feeding (middle) oil tank of the central canal. The central canal in crank would not effect on the actual moment of inertia of the crank as its cross section is always circular.

6. The pistons with its flexibility arms will reduce the reciprocated movement with minimise descending, (in distance between upper and lower piston's dead point); du to increasing of the engine speed, due to the design, in a matter (counters to conventional system's principle-at high speed!); reduce vibrations of the main engine parts movements while increasing speed. The relation of push-arm

depressing speed (time) with a rotation speed of the wheel in increasing engine's speed would lead to the equilibrium situation (as assumption) in very fast speed, it is a criteria of reducing chamber expanding combustion space for fuel at explosion; decreasing with speed increasing!

It is the miracle of the circular shape where the centrifugal powers exist in engine.

This is a very important character and would be utilised for reducing fuel consumption while increasing speed, using computerised advanced accessories. The pistons with their free flexible arms will reduce the reciprocated movement to minimise it decreasingly (the distance between upper and lower piston's dead points); due to increasing of engine speed, in this design. This matter reduces displacements of main engine parts (pistons) movement while increasing speed, (not kept in constant displacement at high speed as in conventional system!) by implementing physical concept related to a spherical rotating in speed and accelerating by reaction of linear forces effects on it. The reduction of push-arm depressing distance with increasing wheel speed due increasing engine's speed would lead to theoretical assumption of a minimum movement in the very fast speed. It is a physical criteria of the consecutive reducing in chamber's expanding space for fuel at explosion and the way of this characteristic transferred by the same emission gases in chambers to reverse it to act positively on engine output.

It is one of mighty God miracle in creating the very huge Space Universe and the little knowledge of man on that , one of what's concerning the spherical shape bodies, that is the centrifugal concept , man is trying to use this concept in reducing (said)fuel consumption in his very little engine, while increasing speed, as most pioneer characteristic to be utilised by using advanced accessories.

7. This engine system does not contains those valves that used in the old engine with their timing articulated connecting system, (camshaft, tapping springs....etc); that valves with its mechanism however will limit the high speed of the engine, which need complicated frictional slippers and accessories as timings systems, which may fail in high speed, as for the modern engines with more valves number for a piston. Those are not existing in this system i.e. delete their problems, noises and air smoke related with any of their defect, although delete their failure which may happen in high speed.

This engine system does not contain those valves that used in the old engines with their timing articulated connecting system, (camshaft, gear, pinion.. etc.) (Those valves with their mechanism however will limit the high speed of the engine since they may fail in high speed, as they need complicated frictional slippers and accessories for timings systems, even using more valves number for each piston in recent engines). Those things are not existing in this system i.e. cancelling their weight, noises and expected air smoke related with any of their defect also cancelling their problems of failure that may happen in high speed.

8. The fuel air mix can be controlled easy in this engine form out side accessories, in two way by controlling the supplying pressure and also by controlling the fuel mixture, or both together, since the system doesn't required the same fuel compression ratio in all wheel chambers or in all its working situations with the independent characteristic of pistons performance and the independent units performance and the flexibility in the engine. Different types of fuel, any gasoline (Benzene)octane with a regulator for fuel splash charger. Jet gasoline or (gas) can be easy used in this system after reconsidering the accessories.

The air-fuel mixture quality can be controlled easily in this engine from out side accessories, in two ways by controlling the supplying pressure and also by controlling the fuel mixture, or both together depending on design data, however the system may not require a same(ideal) uniform fuel compression ratio in all its chambers or in all of its working stages, since independent pistons performance characteristic with their ability of various displacements providing flexibility in the engine to make this system easily uses different types of fuel efficiency, any gasoline(Benzene)octane, or Jet gasoline or even Gas fuel could be used after reconsidering the mixture accessories requirements for charging these fuel.

9. Cooling and cleaning of the chambers by outside pressured air (scavenging) directly after hot gases exhausted (stroke). This will control the heat of piston capping and supply perfect adiabatic efficiency of air (heat loss) system for pistons in addition to the wheel side-walls oil cooling (enthalpy) of cylinder bore. The air also will prevent the remain of after burning carbon (soot) and will complete oxidise un-burned fuel and carbon oxide gas (CO) to complete oxidation it directly to (CO₂), same for nitrite oxide (NO), and SO if exist, this is a very practical way in anti-pollution system's treatment, in away to help conserve the good environment and atmospheric ozone and to help prevent acid rain.

When there is no sufficient way or time for cleaning the exhaust gases from the chamber in very high speed, it is possible to make the control system to delay the ignition for each dual high speed revolution, without big problem.

Cooling and expelling exhaust gases of chambers from outside by puffing air (scavenging) directly on it at end of exhaust stroke. This will control the heat of piston cup and supplying perfect adiabatic efficiency of air cooling technology for pistons in addition to the wheel side-walls oil cooling & enthalpy of cylinder walls. The air also will prevent the remaining of after burning carbon (soot) and will complete to oxidise unburned carbon oxide gases i.e. (CO) directly to (CO₂) or (H₂O), same to complete oxidation for the sensitive nitrite oxides (NO_x), (and SO -if exist). This a practical way for anti-pollution treatment technology inside engine, in a way to help conserving the environment and to prevent occurrence of harmful acid rain in industrial territories, all these missions could be under a perfect control. When there is no sufficient time to complete expelling exhaust gases of a chamber* in a highly speed, it is possible to make this mission repeated for each twice revolution of this chamber, by having a management (as this system permits for that) to make the fuel feeding for it* to be for each double revolutions consequently & harmonically.

10. There is a new way of lubrication for the pistons that only the moving one will be lubricate when it needs to, as each piston has it's own oil pump, and the lubrication system in away that can reduce too much the pollution of air-oil smoke, since no crank case sump bellow the pistons, however no leakage gas affliction on oil sump if this happen.

There would be an air pad(s) under the piston(s) that could use it's advantage in a special piston design to maintain an almost equal pressure in high temperature in the two sides of piston i.e. on it's seals to be utilisedfor longer maintenance period and for output.

There is a suitable way of lubrication for the pistons that only the moving one will be lubricated when it needs to. Each piston has it's own private oil pump, and the lubrication system designed in away to reduce too much the pollution of air-oil smoke, since no crank case-oil sump bellow the pistons, however a leakage gas affliction will not cause oil smoke as much as old system does; if this happen.

There would be an air pad(s) under the piston(s) that could use its advantage in a special piston design to maintain a sufficient pressure in high temperature

beneath piston to use it to be utilisedfor longer seals maintenance period and for output. This way could be connected for dual piston effect in one wheel.

11. The distribution of piston (cylinder) angles against the crank C. L. in the engine will not need a balance weight which existing in recent engine, and their metal bearing (begins) pads on crank shaft for stress points lubrications to reduce friction on crank shaft which affected obviously in that system by high speed, those are not required in this engine system: The way of emission gases exhausted with the rotation direction will minimise the stress on seal mass, helping the good lubrication for seals.

The distribution of piston (cylinder) angles in the central crank in the engine will not need a balance weight which existing in regular engine. The metal bearing slipping pads on crank shaft for stress points lubricated to reduce friction on crank shaft which affected obviously in that system at high speed. These are not required in this engine system. The way of emission gases exhaust rapidly with the circular rotation's direction will minimise the stress on stroke final seal masses and helping a good lubrication mission for all seals.

12. This new design in distribution of pistons with a unique way in free movements of piston with the rotation of the main shaft (torque crank shaft), since the principle used here – will not need to distribute the stress for every combustion (piston) unit, as for the other; all working time, like what happen in the old system which all connected with the crank shaft; each one with (special angle) in slipping point guarded with metal bearing pads, thus all the combustion pistons will move consecutively (mutual) equal in side the cylinders due to the rotation of the crank shaft, all the time, and will increase with speed ascending causing much friction, lubrication, heat and vibration, which affect the engine efficiency. This new design system reduces piston movement (descending) with increasing of speed rotations; due to spring flexibility (elastic) system reducing: the friction, heat, vibrations noise and, even it can reduce the fuel consumption. Using very advanced controller systems from outside depending on the harmony, hydraulic movement of pistons which will reduce in high speed.

This is a specific design in distributing pistons with its unique way of piston free movements while rotating the Crank (torque crank shaft). The principle used here will not need to distribute the stress for every combustion (piston) unit, as for old regular engines in all working time. That happened in the old system which all

connected with a zig-zag crank shaft; each one with its special angle in slipping point guarded with metal bearing pads. Meaning all the combustion pistons will move consecutively (mutual) side by side equal, in the cylinders due to the rotation of the crank shaft, all the time, this increase with speed acceleration causing more friction, heat and vibrations, more lubrication need, which all affect on the engine efficiency. This new system is not working in that principal, it reduces piston(s) movement in a counter way with the increasing of speed, due to physical concept implemented on this discipline, to reduce bad effects on engine, even it can reduce the fuel consumption in highly speed using advanced controller systems depending on the criteria of rotary wheels and their pistons harmonic linear movement and its performance on certain speeds & applications.

13. The best seen character for this engine is the multi-output powers which can be changed in various ranges not even depending on the rotation speed of the engine but on the working parts inside the engine (automatically power output).

Like for example all parts in used supplying 100% output of the engine for heavy work in a car engine, or 2/3 or less of parts in used for high speed or 1/3 or less of parts in used for just to keep the engine in Ideal working situation, this could be done in away that even its services (for un-used wheel); could be stopped.

This character is very useful: in fuel consumption, in reducing pollution, in long maintenance, this new engine can be produced as engine for every work (multi-purpose) in one equipment (i.e. one car) which an automatically control the output as required, without affecting on un-used parts or make tough vibration.

SHIRWO (Automatically Need) engine will be called Shirw a.n ...(SHIRWAN) system {rotary wheel automatic need}.

The transmission gear complex in this engine would be minimised.

The best seen characteristic for this engine is the multi-output powers which can be changed in various ranges not even depending on the revolution speeds of the engine but on the required movement of the working pistons inside the engine (automatic power parts output). Like for example all piston in used supplying 100% output of the engine for heavy work in a car engine(4x4 wheel in work), or 2/3 or less of parts in used for high speed or 1/3 or less of parts in used for just to keep the engine in Idle working situation. This could be done in away that even its oil services could be stopped by controlling their relevant centrifugal air outlet .

This characteristic is very useful: in reducing actual fuel consumption, reducing pollution & providing longer maintenance. This new engine can be produced as engine for every work (multilateral-purposes) in one equipment(i.e. one vehicle) which is automatically providing various ranges of output as required, without effecting on unused parts or causes tough vibration, (i.e. an auto output engine) as for different ranges of maximum Hours Power e.g. excellent use for 4x4 track. SHIRWO + Automatic Need auto engine will be called (SHIRWAN) SYSTEM {S.H..I.R.W. Automatic Need = SHIRWAN for automatic-power-output engine }.
The heavy transmission gear complex in this engine could be minimised or even terminated but of course keeping the reverse position in work .

14. Since there is the ability of stopping some of piston's movements (or all) in this design with the continue of rotation of the crank, the engine can be combined with an electric power engine in the same crank in an advanced design with a very practical use (fuel combustion engine and electric power engine in one unit set) depending on the simplicity design and minimum torque loss of this new engine which can charge the electric battery when the combustion engine working, and can use the electric power engine directly instead – if it needs; at required situations as needs in a crowded city, to reduce the pollution.

Since there is the ability of stopping piston's movement in this design while crank continues in its rotation plus the circular slice machinery. The engine could be combined with an electric power engine mounted on the same crank or by clutch as advanced engine design with very practical use, it is a fuel combustion engine with electric power engine in one unit set . Depending on the simplicity of this design which can charge an electric battery when the combustion engine working. The electric power engine could be used directly instead – if it will be required when a situation needs i.e. a crowded city, to reduce the pollution. This is a piston - electric output (combustion - electric) in one combined engine unit.

15. In addition to other characters and proposals which can be obtained in industrial laboratories this machine will fill the gap between the normal pistons combustion engine – and turbine Jet engine using their-all-good characteristics together in one engine, it will use the good characters of combustion piston (rotary) engine in economic fuel consumption, slow rotation speed if required, small engine and easy to manufacture and maintenance, with the Jet characteristics of high

power, high rotation speed if required using the aerodynamic power of exhaust gas with other potential powers; in an advanced designed and cheap engine unit. In addition to other characteristics, proposals and options which can be obtained in industrial laboratories this machine will fill the gap between the normal piston combustion engine, and the turbine Jet engine using their-all-good characteristics together in one engine unite, it will use the good characteristics of combustion piston (and rotary) engine in economic fuel consumption, slow rotation speed if required, small engine and easy to manufacture and maintenance, with the Jet characteristics of high power, high accelerated speed if required also by using the aerodynamic power of exhaust gases with other physical potential powers; all in this integral design and cheap engine.

16. This design will open the wide gate for computer participation in controlling all the activities and performance characteristics using advanced controller's accessories in this system at the near future. The speedy efficiency of the this engine and its good characters, which will give this engine a great economic influence.

The very important characteristic of reducing(decreasing) fuel consumption rapidly with speed increase .The analysis will leads to use it mainly in high speed that causing less reciprocating piston movement in engine, which makes it very qualified engines for Hoover Craft or flying equipment. A promising generation of combustion system will appear in the 21st century, to be used in advanced small Hoover craft (or a composite vehicle of it with Automobile)by implying this system for a cheep advanced computer controlled -running and flying-transportation equipment.

more advanced research on it will continue, for an example the Laser ignition may be used in its ignition due to its high speed!

This design will open the wide gate for the computer participation in controlling all engine activities and its characteristics performance by using advanced controlling accessories with economic industrial influence in the age of computer.

17. The fabrication of the extensive and various options of this engine design could be implied easily when utilising the main parts of this system from those elastic devices springs or else used in the automatic emission of weapon re-fill in the different machine-gun and fast-cannons ,i.e. those weapon industries could

transfer a good part of their production to participate in produce these engines for peace purpose...!

This engine could work in a vertical direction engine related to the torque crank since most of engine oil services depend on centrifugal concept related on speed.

Its important characteristics and the ways of reducing(decreasing) fuel consumption rapidly with high speed increase, this will lead to use it mainly in high speed equipment that needs less reciprocating piston movements which makes it very qualified engines for Hoover Craft or flying equipment.

More advanced research on it will continue, for example computer formatting ready programs and the use of advanced Laser ignition could be used .

18. The variety of design options on this system could be implied easily since the main (elastic) parts of this system could be used from the variety of elastic devices springs or hydraulics used in the automatic re-fill emission weapons, those various machine-guns, the fast-cannons, i.e. those weapons industries could participate practically indeed by a good part of their products in supplying main parts of these engines, to start changing those industries for man's civil and peace purposes ! .

DESIGN PROPOSALS AND OTHER OPTIONS : { Article place changed }

1. This engine can contain many power wheel units depending on the out put torque power, with a relation to the diameter and number of cylinders in each wheel, the various proposals and options of this system provide a diverse use for it.

This engine could contain many power wheel units depending on the out put torque power, with a relation to the diameter and number of cylinders in each wheel, the various proposals and options of this system provide extensive use .

2. The power wheel units could be in different diameter for engines, the principle of piston's moment effect on Crank will be considered in related to output power using the required wheel, cylinder diameter in any engine design.

Although the ability of controlling power units performance; as (Shirwan engine).
(Fig 2/25, 17/25 & 21/25, 22/25).

The power wheel units could be in different diameters for kinds of engines, the principle of piston's moment effect on the Crank will be considered in related to

output power using the required wheel and cylinder diameter in any engine design as these are some engine options. (Fig 2/25)

3. Double ignition systems (accessories) in one large (super) power wheel unite one or more in engine, simply could be used. (Fig 24/25).

Double ignition systems (accessories) in one large (super) power wheel unite, one or more in an engine, could be used as some engine options. (Fig 24/25).

4. The main tunnel (canal) for oil supply in the crank can be out side the crank by special connected parts on all the rotating parts on crank with longitudinal line holes as tunnel (canal) a cross all parts (that stickmen together) parallel with shaft line, in its boundary, with its holes for each oil feeding requirement with regard to balance rotation system.

The main canal(tunnel) for oil supply in the crank could be seated out side the crank. A longitudinal tunnel connected parts on the crank as a canal across all parts (that stickmen together), parallel to the crank line as its boundary, with holes for each part, for oil feeding, considering the main intake and parts balance. The oil supplied for radian seals by specific tunnels in the case via modified pad.

5. The water can be used for cooling Power wheel units walls by special design for Case in extensions between the wheel units contain canals for water cooling the oil and near the wheel side-walls.

The water could be used for cooling power wheel units by a specific design for Case with more extensions between the wheel units containing canals for water, or using air cooling system ,as these are some options .

6. The difference of cylinder number in wheels with their accessories required depends on speed and output power of the engine; (Fig 14/25)

The difference of cylinder number in a wheel depends on the diameter and speedy output power of the engine as these are some options. (Fig 14/25, 24/25).

7. The cylinders in each power wheel unit in the same engine could be in various diameters than the other wheel with special accessories as required for Automatic power engine (Shirwan) engine...(Fig 15/25).

The cylinders in each power wheel unit in the same engine could be in various diameters as a specific in each wheel with relevant accessories as required for Automatic power engine, as options of Auto-Engine. (Fig 15/25).

8. The use of different wheel diameter in one multi purposes engine; with special accessories as required, for Automatic (multi) power engine; (Shirwan) engine. Auto-Engine (Fig 16/25). {place changed }

The fuel spray system can be in one set for all air-fuel mix by a pre-mixed fuel feeding the valves, or could be separated pipes control for each power wheel units in the engine, controlled by advanced computer system, as required for Auto-power engine .They could be substituted by a direct fuel mixture injection on each chamber by additional Case fixed device for each wheel. (Fig 21/25, 22/25).

9. The fuel spray system can be one set for all air-fuel mix, or can be separated for each power wheel units in the engine controlled by advanced computer systems, as required for Automatic power; (Shirwan) engine (Fig 21/25, 22/25).

The pre mixed fuel injection (indirect) for charging valves, which used her, can be substitute by direct injection on chambers by Case fixed device for each wheel.

The fuel spray system could be controlled by a computer system to monitor the required spray mixture with air and could vary this mix for each type of gasoline octane by automatic device as required for multi -purpose Auto-Engine .

10. The fuel spray system can be controlled by computer system to maintain the required spry mixture with air and could vary this mix for each type of gasoline octane content by automatically device as required.

The use of different wheel data in one engine; with specific relevant accessories as required with automatic control for varieties in output range.This is the automatic multilateral power engine. Auto-Engine(Shirwan engine).

11. The places of the big gas mass seals can be changes depending on the design data; the type and way of work depend on the type of industrial production.

The places of the radian Case seals can be changed depending on the design data and type of application depending on the industrial production.

12. The exhaust opening could be in different grade openings and angles related to engine design and fuel criteria and could be mechanically changeable control!

The exhaust opening could be in different grade openings and angles related to engine design and fuel criteria and could be in mechanically changeable design for wings grades and directions by a mechanical device control.

The exhaust opening could be in opposite direction depending on Case design.

13. The flexible (elastic) system of piston push-arms could be of various types for different engine designs (or even different in one advanced automatic, engine)

using metal spring, gas or oil hydraulic device - heat resistance – like those used in automatic gun weapons, it might be more tight and modified by heat increasing!

The flexible (elastic) system of piston push-arms could be in various types for different engine design (or even with differential diameter along one spring) using metal spring, gas or oil hydraulic device - heat resistance - like those used in automatic gun weapons, it might be more tight and qualified by heat increase !.

14. An advanced new modified system under the name of (connected hydraulic wheel unite system) could be used, that can get use of the impact power on piston at the firing stroke instantaneously to transfer apart of this power to opposite direction affects on the other piston in the same wheel at a position; when its combustion gases (in previous action) start to loose from exhaust opening, in a way to supply an impact press from inside (cylinder) to push piston outward pressing on those gases, in chamber, accelerate hem to fast release from graded opening, which will create reaction on opposite direction increase torque with additional power on wheel, this technique of connecting resistant system of two pistons in one wheel in a very advanced modified system as a part of this development researches as many other patents included in this system. (Fig 12/25).

An advanced new modified system under the name of (connected hydraulic wheel unite system) could be used, that can get use of the impact power on a piston at firing stroke instantaneously to transfer a part of this power to effect on opposite direction on the other piston in the same wheel at a position when its combustion gases (of previous piston) start to lose from exhaust opening. In a way to supply impact force from inside the cylinder to push piston outwardly faster for expelling those gases from the chamber. Accelerating them to release faster from the graded opening. Which will produce more reaction on the opposite direction increasing turbine power on the wheel. This is a technique of the connecting hydraulic system of two pistons. It could be working also between the spaces beneath pistons in one wheel .This is advanced modified option as a part of the development researches on this system. (Fig 12/25).

15. The ordinary oil pump can be concealed in the engine if a special design for the oil tunnel in Case directed oil to the feeder tank for central oil tunnel in the engine crank. The oil will naturally flow due to rotation of a huge natural centrifugal oil

pump(s) of cooling-lubrication pads which radian grooved in a required way (especially the last pad).

The central oil canal in the crank would not effect on the moment of inertia of crank circular cross section, as this depends on the size, diameter and metal capability of torque resistance of Crank related to its canal diameter. The usual oil pump could be cancelled in a design could make oil tunnels in Case driving oil to the middle oil feeder tank that feeding central oil tunnel in the engine crank.

16. The ignition distribution can be in advanced electric design. It might need additional timing device as for old system but with more simple method, and even can use the electronic computerised device due to the fast rotation of engine as one part of computer system research of this patent.

The mechanical ignition distribution could be in advanced electric design. It might need additional timing device as for old system but with more simple method, and even could use clever computerised device or (Laser) due to the fast rotation of the engine as a part of advanced developments on this system.

17. The metal industry for wheel allies, its grooves and tunnels can be easily done with the facilities of metals and casting drillings available in recent manufacturer. (Fig 9/25).

The metal industry for alloys, the grooves and tunnels could be easily done with the facilities of metal casting, and drillings available in recent manufacturers.

18. This engine could be designed for a vertical crankshaft direction with the same principal of this system to be used for Hoover craft and flying equipment.

This engine could be designed in a vertical crank(shaft) direction with the same system principal. It is because of most oil services are depending on the centrifugal energy which could work in any direction, the engine oil pump could be cancelled. This means it could be easily used for flying equipment or Hoover craft regarding the simplicity, the speedy efficiency, the output power and the small size. this promising generation of clever engines would be used for advanced small Hoover craft (or a composite vehicle as Automobile and Hoover Craft or running and flying transportation equipment) by implying this cheap system with using of advanced computer control. (Fig. 23/25).

THE DRAWINGS CONTENTS :

Important note:

The drawing are assumed in typical (assumed) dimensions for A2 size drawings in Autocad diskette program to declare the composition of engine but not the same scale for A4 although not necessarily for industrial design requires.

FIG No (DWG No),

- 1/25 (1) : GENERAL SHAPE
- 2/25 (2) : TYPICAL POWER WHEEL UNITS IN ENGINE HORIZONTAL SEC.
- 3/25 (3) : TYPICAL POWER WHEEL UNITS IN ENGINE VERTICAL SEC.
- 4/25 (4) : TYPICAL SPRING MODIFIED CROSS SEC.
- 5/25 (5) : TYPICAL THREE-POWER WHEEL UNITS SECTION PLAN
- 6/25 (6) : TYPICAL POWER WHEEL UNIT OIL CANALS ANALYSIS
- 7/25 (7) : TYPICAL COOLING, LUBRICATION PAD
- 8/25 (8) : TYPICAL PISTON ANALYSIS
- 9/25 (9) : TYPICAL ENGINE PARTS
- 10/25 (10): TYPICAL DIMENSION OF POWER WHEEL UNIT
- 11/25 (11): PISTON PUSH-ARM MODIFICATION
- 12/25 (12): DUAL CONNECTED PUSH-ARM OF PISTON
- 13/25 (13): VARIOUS PROPOSALS
- 14/25 (14): VARIOUS CYLINDERS IN A WHEEL
- 15/25 (15): VARIOUS PISTONS DIAMETERS ENGINE
- 16/25 (16): VARIOUS WHEELS DIAMETRES ENGINE
- 17/25 (17): FOUR-POWER WHEEL UNITS ENGINE
- 18/25 (18): FORCES ANALYSIS
- 19/25 (19): TYPICAL ENGINE PERFORMANCE
- 20/25 (20): A PROPOSAL FOR SEAL-MASS DESIGN
- 21/25 (21): TYPICAL ENGINE ACCESSORIES PROPOSAL 1
- 22/25 (22): TYPICAL ENGINE ACCESSORIES PROPOSAL 2
- 23/25 (23): A TYPICAL ENGINE FOR FLYING EQT- VERTICAL CRANK SHAFT
- 24/25 (24): A TYPICAL ENGINE FOR A WIDE WHEEL
- 25/25 (25): DETAILS OF ENGINE DRAWINGS

Important note: The drawings were in colour typical assumed dimensions using A2 paper size done by Auto-cad diskette program to declare the compositions of engine. They are now(here) in scale for A4 and in black & white in the enclosure set of drawings as required, also they are not in scale for actual industrial use.

FIG No (Drawing. No), {{ same serial with more clarification references}}

1/25 (1) : GENERAL SHAPE

2/25 (2) : TYPICAL POWER WHEEL UNIT IN HORIZONTAL SECTION.

3/25 (3) : TYPICAL POWER WHEEL UNIT IN VERTICAL SECTION.

4/25 (4) : TYPICAL SPRING MODIFIED CROSS SECTION.

5/25 (5) : TYPICAL THREE-POWER WHEEL UNITS SECTION PLAN

6/25 (6) : TYPICAL POWER WHEEL UNIT OIL CANALS , ANALYSIS

7/25 (7) : TYPICAL COOLING, LUBRICATION PAD

8/25 (8) : TYPICAL PISTON ANALYSIS

9/25 (9) : TYPICAL ENGINE PARTS

10/25 (10): TYPICAL DIMENSION OF POWER WHEEL UNIT

11/25 (11): PISTON PUSH-ARM MODIFICATION

12/25 (12): DUAL CONNECTED PUSH-ARM OF PISTONS

13/25 (13): VARIOUS PROPOSALS

14/25 (14): VARIOUS CYLINDERS IN A WHEEL

15/25 (15): VARIOUS PISTONS DIAMETERS IN ENGINE

16/25 (16): VARIOUS WHEELS DIAMETERS IN ENGINE

17/25 (17): FOUR-POWER WHEEL UNITS IN ENGINE

18/25 (18): FORCES ANALYSIS IN THE ENGINE

19/25 (19): TYPICAL ENGINE PERFORMANCE

20/25 (20): A PROPOSAL FOR SEAL-MASS DESIGN

21/25 (21): TYPICAL ENGINE ACCESSORIES, PROPOSAL 1

22/25 (22): TYPICAL ENGINE ACCESSORIES, PROPOSAL 2

23/25 (23): A TYPICAL ENGINE FOR FLYING EQT- VERTICAL CRANK SHAFT

24/25 (24): A TYPICAL ENGINE FOR A WIDE WHEEL

25/25 (25): ALL DETAILS OF THE ENGINE UNIT

DRAWING DETAILS – DECLARATIONS...(ALL THE DRAWINGS)

1. Chamber (combustion room).
2. Case (engine Chassis).
3. Wheel (Power wheel unite - energy unit).
4. Anti-scratched alloy (modified wheel surface).
5. Metal spring (straight or inclined).
6. Crank (power-torque crankshaft).
7. Piston push-arm (flexible shaft device).

8. **Piston push-arm base. (cylinder base).**
9. **Spark plug.**
10. **Piston lubrication pump (built in, not as scale of drawing).**
11. **Oil tunnel (canal) for piston lubrication feeder.**
12. **Bolts for fixing seal base (in Case).**
13. **Pinion ring to transfer rotation to other device (for ignition...etc).**
14. **Solid steel ring for piston locks (in cylinder).**
15. **Canal in case for oil system (flow back).**
16. **Regulator adjustment for big seal mass.**
17. **Pad for cooling & lubrication.**
18. **Ring seals in piston.**
19. **Big seal mass in Case (anti-gas).**
20. **Air-fuel mixture-chagrin's system (pre mixed fuel injection).**
21. **Pressured pure air (scavenging of chamber); charting's system.**
22. **Valve (one way- air check valve).**
23. **Canal of water's cooling system in Case.**
24. **Central oil's main supply canal.**
25. **Engine base flexible holder.**
26. **Big circular wheel oil seal, wheel slide-bearing (anti-gas, anti-oil).**
27. **Ball bearing device.**
28. **Oil pump (for engine).**
29. **Water pump.**
30. **Exhaust aerodynamic special opening.**
31. **Cladding perforated hollow pipe.**
32. **Main assembling bolts for Case.**
33. **Ignition distributor.**
34. **Feeder oil tank for engine.**
35. **Oil sump.**
36. **Oil pump intake.**
37. **Oil supplies pipe.**
38. **Oil refill opening.**
39. **Oil locked washer.**
40. **Tightening ring (washer with pin).**

DRAWINGS DETAILS - DECLARATIONS...(IN ALL THE DRAWINGS)

1. Chamber (combustion room).
2. Case (engine Chassis).
3. Wheel (Power wheel unite).
4. Wheel modified circumference (scratch resistant alloy).
5. Metal spring (straight or inclined).
6. Crank (torque-crankshaft).
7. Piston push-arm (flexible shaft device).
8. Piston push-arm base. (cylinder base).
9. Spark plug.
10. Piston oil pump (built in with push-arm).
11. Oil tunnel (canal) for piston oil feeder.
12. Bolts for fixing seal base (in Case).
13. Pinion, gear ring to transfer rotation to other device (for ignition).
14. Solid steel ring for piston lock (in cylinder).
15. Canal for oil service.
16. Regulator adjustment for big seal mass.
17. Pad for oil cooling & lubrication.
18. Ring seals in the piston.
19. Big seal mass in Case (anti-gas).
20. Air-fuel mixture charging device (pre-compressed mix. feeding).
21. Air charging for exhaust stroke (on chamber).
22. Valve for air pipe(mechanical- control). / (22d - air check valve).
23. Canal for water cooling service in Case.
24. Central canal for oil supply - in Crank
25. Engine base flexible holder.
26. Big circular sliding seal in Case-wheel (anti-gas, anti-oil).
27. Ball bearing device.
28. Oil usual pump (for engine).
29. Water pump.
30. Exhaust aerodynamic specific opening.
31. Cladding perforated hollow pipe(for piston oil pump).

- 32. Case main assembling bolts
- 33. Ignition distributor.
- 34. Middle oil tank (feeding tank for central oil canal).
- 35. Oil main tank (the engine oil sump).
- 36. Oil pump intake.
- 37. Oil supply pipe.
- 38. Oil refill opening / (for atmospheric pressure equaliser-ventilation).
- 39. Oil lock washer.
- 40. Tightening ring (washer with pin).
- 41. Cylinder for piston in the wheel.
- 42. Piston in the wheel.

The following is Abstract then 30 claims which are seated in simple language to obtain the new technical features and its industrial and commercial advantages provided by each claim on this engine and/or option using SHIRWO System .

ABSTRACT {{ place changed }}

SHIRWO S. :-(Spherical-Sustained-Sliding / Harmonic-Hydraulic / Independent I. C. Intensities / Rotary - Reflected reactions / Wheels / Operating) System, is an internal Petrol combustion spark engine composing types of the recent known combustion principles (those separately used in automotive power) i.e. the piston, rotary and turbine, to perform all together in a compound system unit designed in integral sliding mechanism to achieve the best way in transferring fuel potential combustion energy to automotive power, with minimum power lost inside this engine which has flexibility to bear different ranges of combustion power intensities to be controlled to perform uniformly or independently but in harmonic effect inside the engine, using pre-compressed air-fuel mixture to be boosted to the engine, moreover this design is employing physical dynamics effects due to elements movement inside which appear at engine's work, to be utilised positively instead of losing them as a lost energy inside the engine, by employing techniques of using Nature Physical dynamic concepts to be implemented on these elements to utilise their effects for the benefit of engine output, to make this system depending on fuel potential chemical energy for internal combustion in additional to inside positive consequence physical effects

to produce its final improved output, a system consisting many theories act in association to provide best fuel utility in producing automotive output power related to power-weight ratio, in the meaning of reducing said fuel consumption, this engine (Fig 25/25) comprising from a cylindrical Case 2 having one or many wheels 3, mounted and geared on a straight central (crank)shaft 6 inside the cylindrical cavity of Case 2 for rotation coaxial therein, the said wheel(s) containing at least one cylinder(of piston) 41 in centre-side perpendicular to crank axis, in which it is opened from outwardly upon wheel rotating direction facing cavity of Case 2, a piston 42 mounted inside the cylinder which has the ability of linear movement therein. the piston 42 top together with the cylinder 41 wall (bore) and inner circumference surface of the Case 2 defining a combustion chamber 1, the piston 42 is mounted to the other closed end of the cylinder 41 via a free flexible elastic push-arm 7, circular seals mounted with the Case 2 around the wheel 3 along its circumference 4 on each side edge 26, to isolate wheel performance as well as three or more of seal mass 19 in radial location on the wheel circumference 4 width at designed distances to guard the mod of stroke situation zone in the wheel 3 during the work of the engine, the wheel(s) 3 conducted separately, by fuel mixture inlet(s) 20 via valve(s) 22, spark plug(s) 9, exhaust pipe(s) 30 and air supply inlet(s)21 via valve(s)22 mounted all in Case 2 around the wheel 3 the pre-compressed air-fuel mixture boosted (fed) into the chamber(s)1 from outside by a valve 21 away from firing stroke zone, air is puffed at end of each exhaust stroke, all by using same main accessories (cylinder to store pressured air with recharging compressor, pipes, and spark distributor adapted with the Crank),fuel sprayed for air-fuel mixture by a device 20 before feeding as pressured mixture to be controlled from out side, exhausted gases are expelled via a specific opening 30 mounted in the case, valves 21,22 opened mechanically in the right time against chamber(s)1, controlled by edge of circular metal pad(s) 17, two metal pads 17 used for oil and cooling services around and coincide with (each) wheel 3 working by centrifugal concept contain radius grooves fed with oil from central oil canal 24 by sucking oil from the main central canal 24 inside crank-shaft length via holes then discharge it to outsider case to supply seals with oil, piston-wall oil servicing is by using a rod pump 10 mounted in its push-arm 7 connecting piston oil network with crank 6 oil intake 11, working relative to piston's movement, sucking oil from the central oil canal

24 feeding piston 42 wall contacting the cylinder 41, then to be driven to the a pad 17 at the wheel side-wall, the pads 17 collecting the returning oil from piston(s) 42 in wheels 3 to the outsider case 2, oil is cooled in the Case 2 while flows back to the main oil tank 35 on an end of Case which has specific air opening for pressure equaliser and ventilation for centrifugal requirements, the central oil canal 24 in crank 6 supplied with oil from middle oil tank 34 which kept filled with oil by usual oil pump 36 from main oil tank 35, where more than one wheel are inside the case each wheel could work separately with its independent fuel and air feeding devises controlled from out side, when the engine rotates, chamber(s) will be charged with compressed air-fuel mixture, then reaches firing zone, then it sparks by a plug, then its mixture explosion occurs then pressured gases at power zone, start pushing the piston, making the piston static elastic push-arm dynamically charged to a depressed situation, while pushing the wheel to rotate, the pressured gases exist in the chamber will stay in standard high pressure while kept in closed space of chamber that surrounded by seals from all sides (with radian seals contacting wheel circumference keep on sliding on it) at power zone, while rotating the wheel, using gas characteristic in closed space like a balloon to reflect piston elastic upward reaction (to return to its first static position) by chamber(s) gases hydraulic reaction to countering this force to the piston again then to the cylinder base e.g. wheel keeping the same power of a constant moment on crank along power zone keeping on pushing the wheel to rotate, when the chamber crossing last exhaust gas seal, these pressured combustion gases in the chamber will start to penetrate as exhaust gases, but from designed exhaust opening with directed wings in specific angles to provide effective aerodynamic energy power effected back again on wheel via chamber(s) which is under this effect according to escaping balloon concept with more pressure forced from piston by the release of its charged elastic push-arm beneath it, making this aerodynamic force working faster and more effective in adding additional positive power on the wheel as a turbine principle on wheel(s) as a positive effect of exhaust stroke, to be added on power zone, these missions will be followed on others chambers, pure air is puffed to each chamber at end of each exhaust stroke to expel exhaust gases from chambers, to reduce heat of chambers and to treat pollutant of these gases while still hot, as a built-in technology for treating emission pollution, this system has the pioneer

characteristic of (independent intensities) as independent pistons performance, this engine has the ability of practical reduction for fuel consumption by controlling work of combustion intensity (unit or group) separately for the required application, its design is seated to use the principle of reducing the distances of reciprocated movements of pistons while increasing the engine speed by utilising physical concepts depending on speed factor in relation with centrifugal concept inside the engine to counter fuel consumption at highly speed, the final output presenting the compound performance of this system which is suitable for the computer age by its activities formatting control, its wide options based on the fact that it could utilise those various products of automatic refill-devices of canons or machine guns weapons for use as elastic push-arms inside these engines to provide the participation for weapons industries in fabricating this generation of clever compact power engines, (SHIRWO SYSTEM) is the trademark name and (SHIRWAN SYSTEM) is for Automatic output system. (The claims are followed on the next pages).

THE CLAIMS ON THIS INVENTION : SHIRWO S.

(Marked up copy between primer Ed. of 09,13, 00 sent back by USP & Ed. of 05,07, 01)

(Referring to the drawings Fig 1/25 to Fig 25/25 and the prescription)

30 Claims

1. {The design of this engine:} An engine comprising {from.} a cylindrical case having {at least} one or many wheel(s) (i.e. fly wheel) mounted {coaxially} and geared on central a straight (crank)shaft inside the cylindrical case for rotation coaxial *therein* {The} ,the said wheel(s) containing at least one cylinder (of piston) in centre-side perpendicular to the crank axis, { in which it is opened from one side to the inside circumferential surface of the} the cylinder is opened from one side outwardly upon wheel rotating direction case cavity {. A piston mounted inside the cylinder which has the ability of linear movement therein, the piston's top together with the cylinder wall (bore) and inner circumference surface of the Case defining a combustion chamber { The} ,the piston being mounted to the other closed end of the cylinder via a flexible free elastic push-arm {. , circular seals mounted with the case meaning around the circumference of the wheel along its circumference on each side edge, to isolate wheel performance as well as at three or more radial radial designed distances location contacting wheel circumference width to guard the mod {location guarded} the mod of stroke zones {situation} zone of the wheel during the work of the engine, the wheel {supplied} conducted separately by {with} fuel mixture inlet(s) via valve(s), spark plug(s), exhaust pipe(s) and air supply inlet, via valve(s) mounted in the case around the wheel, the pre-compressed air-fuel mixture charged (fed) into the chamber(s) from outside by a valve away from firing stroke zone, air is charging at end of each exhaust stroke {In the end of exhaust stroke there is a valve feeding air in the right time on the chamber to scavenging and cleaning hot exhaust gases to cool the chambers}, all by using same main accessories (a compressor with pressured gas cylinder, pipes, and a crank adapted spark distributor), , {While these gases expelled via specific aerodynamic} fuel supplied for air-fuel mixture by a spraying device before feeding as pressured mixture controlled from out side {The pre-compressed air fuel mixture charged (fed) into the chamber(s)from out side by inlet valve away from firing stroke zone , using required accessories (pressured gas cylinder, pipes and fuel spraying device all controlled by mechanical or computer system,}exhausted gases are expelled via a specific opening mounted in the case. valves opened mechanically in the right time against chamber(s). controlled by edge of circular metal pad(s) two metal pads used for oil and cooling services around and coincide with (each) wheel working by centrifugal concept depending on centrifugal principal contain radius grooves fed oil from central oil canal by

sucking oil from the main central oil canal inside crank-shaft length via holes then discharge it to outsider case to supply seals with oil and cooling it while driven it to main oil tank at Case end. {The lubrication and cooling services working depending on the centrifugal principal by discharging oil from the main central canal inside the shaft length to engine parts via holes then to outsider case}. piston oil serviced by using a rod pump mounted in its push-arm connecting piston oil network with central oil canal via intake hole, working relative to piston's movement. {The oil servicing for piston wall using a rod pump mounted in its push-arm connecting piston with oil intake, working related to its linear movement sucking oil from the central oil canal}, then ended to wheel side wall then to engine Case. {The wheel has oil cooling pad in each side , fed from central oil canal, collecting oil from. piston(s) then direct oil by radial grooves to outsider case} an opening on the ceiling of main oil tank for centrifugal is available. { Oil cooled in the case while directed to oil tank in the engine end which connected again to the central canal .Where more than one wheel inside the case each wheel could work separately with its independent fuel accessories by controlling from outside.}

2. The engine characterised as in claim 1 , this engine is using combination of piston principle, rotary principle and turbine principle by utilising the exhaust gases aerodynamic affection with extra powers of utilising the physical dynamic energy due to the specific movement of the engine parts to act all positively on increasing output torque of the said fuel.}

The engine characterised as in claim 1, has a discipline composing piston, rotary and turbine principles, to perform all together in a compound system unit designed in smooth simple mechanism to provide best utility for fuel combustion potential energy to transferred to automotive power in the engine .

3. { The engine characterised as in claims 1,2, this engine is using the principle of transferring power from wheel unit(s) as energy unit(s) by the reactions of their content piston(s) affection due to these independent freely elastic push-arm piston(s) movement ,due to reaction of fuel-mix combustion in their chambers .}

The engine characterised as in claims 1,2, the said engine is using the new technique of concentrating the reactions of physical dynamic forces occurred in/by elements inside the engine, to be used positively in engine output benefit.

4. { The engine characterised as in claims 1,2,3, this engine is having various piston number to perform in each wheel without energy loss strokes this means

various power stroke reaction in one cycle to act all positively on the same wheel zone of the torque crank during the work .}

The engine characterised as in claims 1,2,3, the said engine does not have energy-lost stroke, all piston displacements in any direction will act positively during the work for the benefit of engine output, pistons could have various power strokes in one engine cycle to provide powerful engine output.

5. { The engine characterised as in claims 1,2,3,4, this engine is using the advantage of the potential aerodynamic reactions of the exhaust gases to add more output power to the engine thus the exhaust specific opening could be in a fixed place or/and controlled by a regulator in this engine.}

The engine characterised as in claims 1,2,3,4, this engine is using the exhaust gases potential aerodynamic reactions to increase engine output, by using a technique utilising physical concept (escaping balloon) on modified exhaust openings to reflect a turbine reaction on engine rotation, to be a useful factor .

6. { The engine characterised as in claims 1,2,3,4,5, this engine is using the pre-compressed air-fuel mixture to feed i.e. to charge (to inject) the chambers of the engine at working ,as used in the Jet engines .For a better combustion efficiency in squeezing more power in this modified discipline spark engine which could bear various powerful mixture energy.}

The engine characterised as in claims 1,2,3,4,5, this engine is using the principle of Jet in utilising pre-compressed air-fuel mixture to be boosted vertically on modified turbine(s) axis contains flexible elastic piston(s)of this spark modified engine which utilised compound automotive concept(claim 2) to provide the best characteristics of conventional piston system as economic and easily controlled, in additional to a best characteristic of Jet system in a speedy accelerated powerful output, all in this compact engine to establish a connecting bridge on that wide gap between piston engines and Jet engines.

7. { The engine characterised as in claims 1,to,6, this engine is using a separate system for air-fuel mixture feeding valves for each wheel, the relevant perfect timing control mechanism against each chamber their places in a portion away from firing stroke.}

The engine characterised as in claims 1, to 6, this spark engine is using the pre-compressed air-fuel mixture to be boosted(to be fed) for its chambers to provide

a best status for fuel combustion in squeezing powers and to supply rapid acceleration in a discipline has ability to bear and transfer deferent ranges of fuel combustion efficiency directly and safely to automotive power.

8. { The engine characterised as in claims 1, to, 7, this engine is using the principle of charging(injecting) pressured pure air on the hot pistons cup i.e. to the chamber directly for scavenging the exhaust gases , cooling and cleaning the chamber, during ending of exhaust stroke .Its good adiabatic affection, the good expelling of these gases with what could be left of the soot. This could be controlled by a regulator to control the pressure and the temperature .The wheel feeding and ignition could be delayed -in highly speed- to perform for each two revolution automatically to let this procedure works perfectly.}

The engine characterised as in claims 1, to 7, this engine is using the principle of Puffing air on each chamber i.e. piston cup directly at the end of stroke exhaust while still hot for expelling (scavenging) exhaust gases, for reducing heat of chambers in each cycle, providing adiabatic effect, exchanging exhaust gases and cleaning what could be left of soot, thus in controlling pressure and temperature of air feeding, this mission could be completed perfectly for any chamber in highly speed by repeating it in each double cycle by controlling fuel feeding of this chamber to be for each double revolutions, as automatically, consecutively and harmonically with other chambers, since there is ability of independent performance of any pistons.

9. { The engine characterised as in claims 1, to 8, this engine is using a built-in system designed to reduce pollution within the engine discipline by using pressured air injected directly to the hot gases in the chambers while still hot at the end of exhaust stroke. Which will complete the oxidisation of all exhausted gases i.e. CO & NO-x (and SO-x if exist) to be in friendly states to the environment ,preventing acid rain .This could be controlled by a regulator even the way of adding the elements assisting in complete anti-pollution procedure.}

The engine characterised as in claims 1, to 8, this engine is using a built-in technique to reduce the pollution of exhaust gases within the engine, by puffing pressured air directly on the hot gases in each chamber while still hot at each end of its exhaust stroke, which will complete the oxidisation of all exhaust gases i.e. those sensitive CO & NO_x (and SO_x if exist) to be oxidised into friendlier

status before expelled to the environment , it is also a way to prevent acid rain, this mission could be controlled for adding extra anti-pollution factors.

10. { The engine characterised as in claims 1, to 9, this engine using flexible elastic piston push-arm with free movement , which provide a good efficiency for any fuel combustion factor, even for any mix rate (different compression affect) to act on torque crank positively without losing energy. It is a way of maintaining the perfect fuel combustion in chambers, by using the flexible chamber space extending due to free elastic piston push arm. Keeping the required chamber space for a perfect fuel combustion. Keeping the best firing situation for any mixture compression reaction for each fuel regardless of fuel type i.e. benzene octane ...(or fuel mix rate). However the discipline of this system will maintain all resultant energy to be transferred positively on the Crank. Terminating knocking, rumbling problems, that exist in recent conventional engines .This engine is using a principle of free flexibility in transferring fuel combustion energy in the pistons to torque power on the crank since the pistons are not guided by a mechanical connection .This is providing smooth performance with the harmonic affection on engine parts and the powerful fast acceleration performance .}

The engine characterised as in claims 1, to 9, this engine using flexible elastic push-arms for pistons with the free various elastic displacements as this discipline utilise them all positively and effectively on the engine output, by a way of maintaining a perfect fuel combustion in each chamber, by exactly the required extension for chambers space to act in association with other engine effects as this is the flexibility in this system to use any mix rate (different compression effect) upon any piston while engine in performance, it could use different fuel (in octane factor) without mechanical disturbance, keeping the actual required chamber's combustion space for any fuel, keeping the best firing situation for any fuel efficiency to be utilised, terminating knocking, rumbling problems, this system is providing the flexible harmonic distribution of different fuel combustion intensities in the chamber to be transferred all positively to engine output automotive power.

11. { The engine characterised as in claims 1, to 10, this engine is using easy way of charging the air-fuel mix separately to each power unit as the ideal requirement by pr-designed mechanical control on a simple unique spraying device .Or by using computer control of the multi-spraying devices for the automatic feeding

requirements to each power wheel unit (energy unit) for the multi-power output engine i.e. the Auto engine.}

The engine characterised as in claims 1, to 10, this engine is using easy way of feeding the air-fuel mixture to each chamber as in the same (uniform) ideal mixture for all by one fuel spraying mechanical device to feed all chambers , or by using a separate (independent) spraying devices for automatic control feeding for each piston unit (or group of pistons) separately in this system to have the precisely required performance for any application to reduce its fuel.

12. { The engine characterised as in claims 1, to 11, this engine is using a principle of central oil supply tunnel (canal) for lubrications and for cooling operations depending on this engine discipline by utilising the Physical Centrifugal principal on engine rotation. Its good efficiency related to the speed. The oil sump (tank) far from the pistons bases e.g. far from combustion hot gases affection if any leakage happened from the chambers.}

The engine characterised as in claims 1, to 11, this engine is using a specific principle of distributing oil services from central supply canal(tunnel) inside its straight crank via metal pads by utilising the Centrifugal concept on engine rotation, for discharging oil outwardly to engine case, providing good adiabatic efficiency with good oil distribution to engine parts related to its speed, the engine oil tank far from hot combustion gases of chambers preventing expected oil smoke due to penetrating of these gases leakage on oil sump.

13. { The engine characterized as in claims 1, to 12, this engine is using an independent pistons lubrication device of rod-pump working related with piston movement that supplying oil to wall of piston as its movement demands (for piston wall in the cylinder) as it required, separately each by its private pump.}

The engine characterised as in claims 1, to 12, this engine is using independent device for oil service in each pistons by its private pump working relatively to the piston's displacement, supplying the required oil quantity for each piston, (for piston wall touching cylinder wall) independently as the piston demands.

14. { The engine characterized as in claims 1, to 13, this engine is using wheel unit's in transferring combustion energy smoothly to torque by flexible reaction parts without bearing stresses parts with high friction factor, such energy loss is not existing here due to this slice and simple mechanism considering the power-weight ratio criteria.}

The engine characterised as in claims 1, to 13, this engine is using simple mechanism to bear any power range by transferring it to a sliding free rotating reaction by a straight crank mounted on it wheel(s) consisting piston(s) of flexible elastic displacements, the additional effective reactions which acting positively on engine output by employing a criteria of this system in utilising the advantages of this circular shape of wheel(s) in the engine could be called additional spherical sustained reaction of this system on the said fuel output.

15. { The engine characterized as in claims 1, to 14, this engine is using a practical way of reducing fuel consumption ,by the capability of maintaining the exact required working pistons need for any type of engine application, to be for the sufficient performance that needed for the work's demand, by using the required control on feeding accessories for this purpose. }

The engine characterised as in claims 1, to 14, this engine has ability of conducting parts of engine performance needed for any engine application, maintaining sufficient independent parts of engine in work as needed for the required engine output, by the ability in using independent feeding devices for each engine part, providing the exact consumption to reduce fuel for any work.

16. { The engine characterized as in claims 1, to 15, this engine has the ability of the multi-output performances. Its ability of controlling any piston performance. Any piston could work or terminate as required during engine rotation, despite they are all connected on the same crank. This could be happened without influencing on other parts in the engine, related to the engine design concerning the multi-numbers of pistons , wheels and control of the accessories . This is because of the independent piston performance which leads to automatic output performance , i.e. The Auto Engine . }

The engine characterised as in claims 1, to 15, this engine has the ability of providing auto-output performances, by the ability of controlling any piston performance, any piston could work or stops as required during engine rotation, despite they are all on the same crank, this would be happened without influencing on other parts in the engine, related to the engine design concerning the pistons and/or wheels numbers in engine, and a control of the accessories , this provides the pioneer characteristic of this system (i.e. The Automatic Output Power Engine, SHIRWAN SYSTEM).

17. { The engine characterized as in claims 1, to 16, this engine is using a design of the free flexible elastic push-arm pistons, with chambers placed moving in a wheel circumference. Providing the advantages of the physical characteristics of the circular magic shape. In reducing the linear movement on the same direction of the working pistons inside this circle. The piston's depressed decreases with the increase of revolution speed. This physical concept of circular acceleration by its same direction linear force.. A conclusion equations could be introduced to reduce the fuel need in high speed due to approaching a situation of the minimum piston linear movement i.e. minimum chamber(s) expanding. Its graphical curves could be used to program the feeding controlling system for this criteria. In order to reduce the fuel mixture needs for the smaller chambers expansion, rapidly. It means this system countering the fuel consumption in increasing the speed by physical dynamic effect. }

The engine characterised as in claims 1, to 16, this engine is using a specific design of the free flexible elastic push-arm for pistons, with chambers placed in the wheel outwardly circumference, employing the circular shape with its miracle physical advantages in reducing the linear movement of working pistons due to increasing rotary speed of wheel(s) inside engine, the piston's depress decreases with the increase of revolution speed depending on a natural concept of a dynamic circular body rotating and accelerates by consecutive linear force(s) effects on the same rotary direction which will not stay as the same premier force(s) effect while increasing wheel rotary speed or to keep a constant speed. this criteria will be used to reduce linear force of piston(s) acting on a wheel which would be used to reduce the fuel needs required for the consecutive explosions in chamber(s) having reduction in its expanding, due to reductions of piston(s) displacements, means this system as it is boosting(charging) air-fuel to engine, it will reduce its fuel consumption while increasing its speed by utilising the speed-factor in this physical concept.

18. { The engine characterized as in claims 1, to 17, this engine is using the principle of utilizing the Centrifugal principal in highly speed, to reduce the fuel consumption. This is connected with the circular placing of the chambers with free movement of the pistons related with the weight of piston masses and an assumption mass for the gases in these chambers. Keeping the same reaction on the wheel(s), at these high various revolution speeds. This physical reaction

will be reflected by gas pads in the chambers to act on the same positive direction. This means extra descending in fuel consumption with speed increase for the said.

It means this system countering the fuel consumption when increasing the speed by utilising this Physical Dynamic Principals of centrifugal.}

The engine characterised as in claims 1, to 17, this engine is using the principle of utilising the Centrifugal concept directly in highly speeds, to reduce the fuel consumption also, as this connected with the circular placing of the chambers with free movement of all pistons related with the weight of pistons masses and an assumption existing mass for the gases in these chambers, while keeping the same reaction on the wheel(s), at highly various revolution speeds, physical centrifugal reaction will be reflected by gas pad as a balloon inside these mentioned chamber(s) to act again on the same positive direction of fuel combustion inside the engine, this means extra descending in the said fuel consumption with the speed increase in this engine, it means this is a second way of countering the fuel consumption while increasing the speed, the indicator diagram for both claims 17&18 would be used in approaching a theoretical situation of minimum piston linear reciprocated displacement to program a computer control system for actual required feeding to reduce the fuel consumption that needs in highly speed, related to the engine & loading.

19. { The engine characterised as in claims 1, to 18, this engine is using independent valves and could be controlled separately without using that articulated timing connection, cam-shaft, its belts, its gearing, terminating its weight, its noise, its high speed's failure and its easily oil smoke leakage. The slipping bearing pads that exist in rotating parts under stress, This engine is substituting them by chambers gas pads which are in the circular zone-moving contacting the case. No such rotating stressed part here . }

The engine characterised as in claims 1, to 18, this engine is using valves for chambers, controlled separately without using the essential articulated timing connection, e.g. a cam-shaft, this integral system is cancelling the main old slipping stress bearing points those exist on conventional engine's crank and cancelling those articulated parts and their weight in this new engine.

20. { The engine characterized as in claims 1, to 19, this engine could use various ways of regulating and adjusting of almost all engine activities, i.e. controlling

fuel consumption, oil-cooling system, output power, pollution treatment quality, the heat in the engine ,the use of aerodynamic power in output and the termination of the defected piston. The way of stroke seal mass contacts on the wheel circumference could be controlled mechanically or by thermal adjustment with relation to engine speed or engine heat or where to be used as required for any wheel in the auto-engine i.e. from out side by controlling device.}

The engine characterised as in claims 1, to 19, this engine has a discipline seated providing facility ways in regulating and adjusting all engine activities, i.e. control of fuel consumption, output power, pollution treatment quality, the pre-heating of the engine , oil-cooling system, the use of aerodynamic power in output and the termination of the defected piston, the contact status of radian seal in Case with wheel(s) as could be controlled mechanically or by thermal adjustment in relation to engine speed or when to be in used for Auto-Engine.

21. { The engine characterized as in claims 1, to 20, this engine could be modified easily for various kind of power output , keeping the same general dimensions. By changing the elastic push-arm for the pistons only . With little changes in the fuel mixture feeding device. This because of the circular effect and the engine discipline that could bear different power mod without problem.}

The engine characterised as in claims 1, to 20, this engine could be modified easily for various kind of power output, if keeping the same general dimensions, by only changing the qualification of elastic push-arm for group of pistons or all, with little changes in the fuel mixture feeding device(s) if required that is because of the free circular sliding discipline of the engine to bear any range of potential power and more it is depending on piston elastic push-arms.

22. { The engine characterised as in claims 1, to 21, this engine could use various proposals for manufacturing depending on this design principal as different in: power wheel numbers, diameters, cylinders diameters or cylinder (piston) numbers in each wheel, or even deferent dimensions of all these in one engine for the wide auto engine application .A connected hydraulic system for the two pistons in one wheel could be used also to exceed expel the exhaust gases more rapidly. A metal spring of differential diameter could use in the push-arm.}

The engine characterised as in claims 1 ,to 21, this engine could be in wide options depending on this system principal, for various proposals as different in power wheel numbers or diameters, cylinders(piston) diameters or cylinder numbers in

each wheel, or even in dimensions of all these in one engine for the wide application Auto Engine, a connected hydraulic system for two pistons in one wheel could be used also to exceed expelling of exhaust gases more rapidly, a differential cross-diameter of push-arms metal spring could be used.

23. {The engine characterized as in claims 1, to 22 this engine could be used vertically in regards to the crank(shaft) direction as a vertical engine performance that because the oil service here does not depend on the earth gravity, it depends mainly on the centrifugal principal .The speedy efficient power output could make it easily to be used in Hoover craft and flying eqnts.(Fig 23/25).Also wheels could be mounted in reverse exhaust direction.}

The engine characterised as in claims 1, to 22 this engine could be used vertically as its crank in vertical direction as a vertical engine performance, that is because the oil services here are depending mainly on the Centrifugal concept, and the air-fuel is boosting to the engine the speedy output efficiency would make this integral compact engine system is the most suitable for the promising small Hoover Craft and other flying equipment . (Fig 23/25).

24. { The engine characterized as in claims 1, to 23 this engine could use as dual or more ignition spark plugs in big diameters wheels depending on the same design principal considering the radian distances of the stroke situation seals , the exhausts opening , the ignition distributor and the valves mechanism.}

The engine characterised as in claims 1, to 23, this engine could be designed in a dual or more ignition spark plugs in big diameters wheels, depending on the same system principal considering all the requirements, the exhaust openings could be placed as required or even used with moving adjustments

25. { The engine characterized as in claims 1, to 24 , this engine could be used as a group on one or connected crank (shaft), to work for one with variety heavy application, as deferent-power engines each engine could have its own oil services and controlling system to work or stop without influencing on the others that is because of the smooth-slice rotary design that allows slow or high-speed rotation safely with even any part is not performing.}

The engine characterised as in claims 1, to 24 , this engine could be used easily as a group of different-power unites (engines) on the same crank, to work as one engine for heavily application(generations) each engine could have its own oil

services and control, to work or stop without influencing on other because of the sliding rotary design with independent effects of parts.

26. {The engine characterized as in claims 1, to 25 this engine design could use Benzene with different kind of octane or Jet kerosene or even Gas fuel by the same principal system with changes of their power relevant flexible pistons push-arm and their feeding accessories. }

The engine characterised as in claims 1, to 25 this engine could use gasoline (benzene) in different kind of octane or Jet kerosene or even Gas fuel in the same principal, the existing of flexible piston push-arm could provide this capability, by just changing the feeding accessories or pistons push-arm.

27. { The engine characterized as in claims 1, to 26 this engine could be Multi-purposes engine i.e. auto-engine performance, this could be done by using these various proposals for the control devices on :

- A/ Air-fuel mixture feeding pipe opening controlled with a regulator for the pistons in a wheel (for pistons in one wheel-energy unit).
- B/ Air-fuel mixture feeding pipes opening controlled with regulators for each wheel unit (each energy unit).
- C/ Different pistons diameters in any wheel with their particular accessories.
- D/ Different pistons numbers in each wheel with the modified distributor .
- E/ Different wheels diameters with their particular feeding accessories.
- F/ Different piston push-arm (elastic resistance) groups for particular wheel(s) that might use in specific performance i.e. fast acceleration, high speed or in extra heavy work or idle work.
- G/ Exhaust opening angles and its wings direction and the location of the terminal exhaust seal. }

The engine characterised as in claims 1, to 26, this engine however controlled by its pressure of feeding its options of Auto-engines for multilateral-purposes in performance could be provided by different proposals of modifications as :

- A / Air-fuel mixture feeding pipe with controlled inlet for feeding pistons of wheel (the piston in any wheel- unit) by inlet valve regulator or management.
- B/ Air-fuel mixture feeding pipes with controlled inlet for each wheel unit .
- C/ Different pistons diameters for any wheel with their particular accessories.
- D/ Different pistons numbers in any wheel with a modified distributor .
- E/ Different wheels diameters with their particular feeding accessories.

F/ Different piston push-arms(elastic resistance) for any wheel(s) that might be used in a specific applications as a wheel unit(s) for fast acceleration, high speed or in extraheavily work or idle work, or related to other kind of fuel used.

G/ Exhaust opening places, angles, for the wheels its wings direction it could be moveable as required and the location of the last exhaust seal .

28. { The engine characterised as in claims 1,to,27, The engine characterised as in claims 1,to,29 this engine using the maximum potential fuel energy because of:

A / Its constant (and longer) moment arm affection of P.power stroke on Crank.

B / Its positive affection for all pistons' movements (strokes) on Crank.

C / Its less combustion energy loss due to the system slice machinery.

D / Its utilisation of the elastic potential force of the elements .

E / Its utilisation for the best combustion of air-fuel mix in the chamber always.

F/ Its usage of the pressured charged air-fuel mixture to the chambers.

G/ Its utilisation of the aerodynamic power of exhaust gases in output.

H/ Its utilising of all the physical powers occur with the internal combustion .}

The engine characterised as in claims 1,to 27, this engine is using maximum fuel potential energy in output to be a powerful engine because of :-

A / Its longer effect and constant moment of piston Power stroke on Crank.

B / Its pistons strokes acting all positively on engine output no stroke lost.

C / Its minimum combustion energy lose due to its sliding rotary mechanism.

D / Its utilisation of the potential elastic effect of elements inside the engine.

E /Its utilisation of perfect combustion for air-fuel mixture in chambers always.

F / Its way of using the pressured boosted air-fuel mixture into the chambers.

G / Its utilisation of the aerodynamic power for exhaust gases in output.

H / Its utilisation of the physical powers reactions occurred inside the engine.

29. The engine characterised as in claims 1, to, 28 , this engine is suitable for a computer age since its parts perform independently to fit prepared programs.

{{29. Was a missed point}}

30. { The engine characterized as in claims 1,to 29 this engine is without energy loss stroke , and could eliminate the gear transmission in a vehicle if working as auto engine, and could use simple fuel spraying device in stead of the complicated carburetor used now with easily computer controlled.}

The engine characterised as in claims 1, to 29 this integral engine would eliminate the gear transmission box in a vehicle if used as Auto Engine, it has

simple fuel spraying devices, it has safe high speed efficiency as the more speed the less vibration(i.e. less distance of pistons displacements) with high adiabatic efficiency, this system has wide options since it could use those various elastic devices used in refill usual automatic weapons such as canons or machine guns to change those products to mankind civil purposes ! .

{31. The engine characterized as in claims 1, to 30, this engine is utilising the principle of the automatic emission re-fill for the weapon i.e. for shoot-gun and fast-canon and could use the same flexible parts to provide useful ways in transferring this harmful industries to peaceful useful industries ...!}

{32. The engine characterized as in claims 1,to,31 this engine can work slowly or very fast performance due to its smooth, slice rotary speedy efficiency. }

{ old } new

ABSTRACT {{ this article was not sent back with origin App.}}

{ This engine, **SHIRWO: (Speedy-Spherical, Harmonic-Hydraulic, Independent I.C.- Intensities, Rotary, Wheels, Operating) :-**

An engine comprising from a cylindrical case having at least a wheel(s) (flywheel) mounted coaxially on a straight central (crank)shaft inside the cylindrical case for rotation therein, the said wheel(s) containing at least one cylinder in centre-side perpendicular to crank axis, in which it is opened from outwardly to the inside circumferential surface of the case cavity, a piston mounted inside the cylinder which has the ability of linear movement therein. the piston top together with the cylinder wall (bore) and inner circumferential surface of the case defining a combustion chamber, the piston being mounted to the closed end of the cylinder via a flexible free elastic push-arm, seals mounted with the case meaning around the circumference of the wheel along the edge at each side, as well as at three or more radial locations guarding the mod of stroke situation zone during the work of the engine, the wheel supplied with fuel mixture inlet(s) via valve(s), spark plug(s) exhaust pipe(s) and air supply inlet(s) valve(s) mounted all in the case, the pre-compressed air-fuel mixture charged (fed) into the chamber(s) from outside by a valve away from firing stroke zone, same for air feeding at end of each exhaust stroke, all by using required accessories (pressured gas cylinder store with a compressor, pipes and fuel spraying device controlled by mechanical or computer system), exhausted gases are expelled via a specific opening mounted in the case ,valves opened mechanically in the right time against chamber(s), the lubrication and cooling services working depending on the centrifugal principal by discharging oil from the main central canal inside the shaft length via holes to engine parts then to outsider case, the oil servicing for piston is using a rod pump mounted in its push-arm connecting piston with crank oil intake, working related to piston's movement, sucking oil from the central oil canal feeding piston wall, then ended to a wheel side-wall, the wheel has oil cooling metal pad in each side controlling valves mechanism, fed from central oil canal, collecting oil from piston(s) then to direct oil by radial grooves to the outsider case, oil cooled in the case while directed to the oil side tank with specific air opening, where more than one wheel are inside the case each wheel could work separately with its independent fuel and air feeding controlled devises from out side i.e. computer . -

This compact engine consisting a combination of a piston principle, a rotary principle and a turbine principle by using free pistons movements in addition to a principle of utilising inside-engine parts dynamic physical effected forces, all associated in an integral specific discipline to increase engine output from said fuel by increasing the fuel efficiency reducing energy lose in this integral engine or could reduce the said fuel consumption for the same application. When the engine rotates, chamber(s) has been charged with pressured air-fuel mix. reaches the firing zone, it sparks by a plug, then its mixture explosion will happen and gases will expand in the power zone, will push the piston, making the piston elastic push-arm charged (depressed situation), while pushing the wheel to rotate, the pressured gases exist in the chamber will be in a standard high pressure by kept locked by seals from all sides in the wheel circumference, while rotating the wheel. Using the gas characteristic in closet space like a balloon to reflect the piston upward reaction which kept pushing to return to its place, by its push-arm beneath, countering this force to the piston again then to the cylinder base e.g. wheel with additional positive power of constant moment as hydraulic reaction, when a chamber reaches the last exhaust gas seal, these pressured combustion gases in the chamber start penetrate, but from specific exhaust opening like directed wings for utilising the aerodynamic energy of pressured chamber gases forced by charged elastic resistant of the push-arm beneath the piston pushing the gases outside making this force working effectively in reflecting more positive power to torque the wheel as a turbine and followed by others chambers. the pure air charged to each chamber at end of exhaust stroke to complete hot gas pollution treatment, expelling these gases and cooling the chamber, This engine has ability of practical reduction of fuel consumption by controlling the piston performance separately for the required application, its ability of utilising physical effects of speed and centrifugal principal on engine parts at highly speeds to use them for the benefit of increasing output efficiency or reduce the (said) fuel in highly speeds rapidly, all together will effect on the relevant power-weight ratio, by using advanced controlling computer system in that criteria , in addition to a built in anti-pollution sub-system for the exhaust gases in this system.

This integral power system could establish a new generation for the near future advanced controlled powerful internal combustion compact engines ... }

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- SHIRWO SYSTEM -(Plant App. PCT/IB99/00178 - USP)

(NEW INTERNAL COMBUSTION POWER SYSTEM)

INTRODUCTION

This is a brief research prescribing practical system for internal combustion engine provides better utility for fuel's energy by a design that could add more potential powers to engine output with perfect control for combustion intensities inside the engine to perform independently in harmonic effect, a system of different technologies associated in a simple economic discipline with wide options, to reduce the actual fuel consumption or to maximise the real potential fuel output.

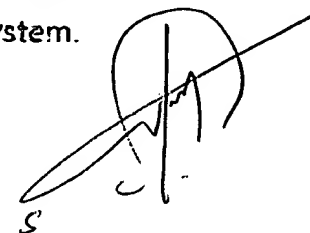
It has been more than hundred years since that invention of Otto petrol internal combustion engine had appeared, still used until now to supply automotive powers. The fast progress in the world, the economical problems, the lack of energy, the increase of pollution on earth, make it necessary to develop more advanced automotive system, A compact engine that could convince the environmentalist organisations and the consumers ambitious to use a system depends on improved techniques to suit the computer age, in the main time providing methods to get use of those huge industries of regular weapons products, to be for civil efforts. Thus such advanced system in specifications, economic and has best utilisation for fuel energy with less pollution effect, is required to provide a promoting solution for the near future problems, (referring to 'Kuoto' summit 1998 about industrial pollution).

A new environment-friendly generation of clever combustion engines is about to be appeared, it depends on a solidarity of many scientific concepts, some defining natural events or has been used in atmospheric flying missions, even beyond it in the space away from earth's gravity; all inside this compact automotive discipline.

It was the inventor's dream ten-years ago to become true at the same time when an industrial community like US Gov. had appealed on 1995 to find more advanced automotive system for the future. This powerful system is flexible in operation and harmonic in performance, An automotive engine, that could become so close to Man's orders as much as close to alive object in work than just a machine.

This system utilises various scientific concepts participated in its missions of performance, it needs professional experts in I.C., automotive mechanics, hydraulics, aerodynamics and essential in physics knowledge, to be able to assess together the compound conclusions implied in the **criteria** of this power system.

(1-40)



Of course more diverse scientific researches in classified industrial laboratories would be needed later on for developing its various and wide options mathematically and practically (by using computer formatting). In order to reach the best commercial standards in using this system for different kinds of applications .

It's time to reconsider the way of using the potential energy of Petrol fuel in producing automotive energy for power engine equipment. In away to improve the energy of fuel combustion in engines, to make it in its maximum useful potential advantage to produce automotive power, by employing some natural universe concepts inside engine discipline, using advanced techniques depending on wide scientific knowledge to make these concepts employed under control inside the engine to be utilised to provide more output power for the fuel in the power engine.

Hopefully this could be a real useful automotive system to solve some future problems by a better way in utilising Petrol -God's generous gift to the mankind - the best powerful available cheap fuel material in the earth, in this economic design which is suitable for the future strict regulations and workable for computer age to fit the 21st century to be declared and invested for mankind peaceful purposes.

This research :

This brief research contains: description, design's principal (back ground), major changes, compositions & accessories, typical engine performance , conclusion of analysing potential ways of producing torque power, useful industrial & commercial characteristics, various design proposals, drawings contents, drawings(Figs) details , abstract and then the Claims, all on 51 pages plus a set of 25 Drawings. (*Inventor personal wording prescribing most considerable sides of this invention.*).

..... **DESCRIPTION**

S-H-I-R-W-O : (SPHERECAL-SUSTAINED / HARMONIC-HYDRAULIC/ INDEPENDENT-

I.C. - INTENSITIES / ROTARY-REFLECTED-REACTION / WHEEL(S) / OPERATING)

S. : System : A SPECIFIC MECHANICAL DISCIPLINE TO MAKE THIS AUTOMOTIVE ENGINE WORKS TO PRODUCE TORQUE OUTPUT (FROM FUEL ENERGY).

A new internal combustion compact power engine in a discipline providing smooth sliding mechanism with flexible performance using the fuel potential chemical energy for internal combustion in relation with additional effects due to employing techniques of using Natural Physical dynamic forces inside the engine to provide better output from the said fuel, a system consisting many theories

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THE MECHANICAL COMPOSITIONS & ACCESSORIES OF THIS DISCIPLINE

Compositions as per the enclosure typical drawings of :-

An Engine of three wheel units -of 2 pistons in each wheel using Gasoline ;

1./ Out side Case (the engine body chassis) a metal cylindrical or octagonal shape (or as the drawings) with a diameter of 330-380 mm in horizontal-position on crank and approx. length (in drawings) of 550-650 mm has a large cylindrical cavity of 301 mm. Contains trenches for seals, tunnels for oil, water and places for valves with special exhaust opening, design & assembling requirements may divide it in parts upper and lower or more, and could permit to cast it in two layers of different alloys with trench's & tunnels. (Det. 2 , Fig : 2/25 & 3/25, 4/25)

2./ The crank (as main crank shaft) a torque output shaft is a straight solid steel iron, placed on the horizontal central line of the engine along the Case length and extended more, its diameter 25 mm-50 mm .The connecting points with the Case by ball bearings, which allow it to rotate only on its centre line. It contains central oil tunnel in its centre line, contains holes for linking oil feeding the rotating parts. Its surface geared (grooved) to interlock, trinket with the rotating parts to move coinciding all together as one system. (Det. 6, Fig : 2/25 & 4/25)

3./ Power wheel unit (flywheel unit) a metal wheel (3 in the drawings) is a solid strong light alloy wheel, a diameter of 300 mm and a width of 100-120 mm with circular circumference strengthen by scratch-resistant alloy, contains (here) two cylinders(for piston) with an outwardly opening placed in centre-side in opposite direction perpendicular to the wheel axis, each with smooth internal surface bore and diameter (here) 80 mm and length of 120-180 mm its central long axis making angle on wheel tangent larger than 45 degree . A piston placed to move in each cylinder adapted with its base, this has two small oil stores (sumps) one which receives oil by tunnel linked with central supply tunnel (canal) in crank for intake oil store to feed piston via piston-arm. Other for outlet oil store receives oil via piston-arm then to dispose it by a tunnel into wheel side. The feeding intake oil store kept in a full mod always, from canal in linked to centre of the wheel within Crank oil tunnel. If required a specific hole with outlet oil store. There are two washers around the crank on the two sides of each wheel for oil lock. There are two edge trenches in the circular circumference face of the wheel fixing a pair of two sides circular wheel gas-oil-slider seals. The number of

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- B. The fuel spray system is a mechanical and/or electrical device with a needle valve which uses a simple principle of permitting fast air passing on small outlet opening of fuel to produce spray in this air as required depending on Specific Density of fuel which maintains in supplied by usual fuel pump(mech. or elect.).
- C. The necessary pressured air will increase due to driver paddle-managing system controlling feeding then speed of engine's rotation and torque power.
- D. The other accessories like oil pump and water pump and ignition distributor will rotate with the crank or as for the industrial design.

The overall work of power wheel units (as all) output with a remarkable rotation speed monitoring the ideal output of this engine could be changed not only by depending on increasing fuel discharge-pressure, it could depend also on other engine modifications for separating engine's part performance as auto-output.

CONCLUSION :

14 The basic design technology of this engine shows a main legend which is to enable to employ the well known physical concepts, those which may inversely proportion with an available factor in any engine, that is the 'speed' to have them in particular combined physical criteria to be utilised for the benefit of the engine output. The design was plant in association to provide practical ways in highly speeds stages to reduce fuel consumption or to increase the power or acceleration by a said fuel. Also to be able to conduct the engine by independent controlling device to feed the engine (there is no relation with engine activity), although the engine could supply indirect power resource as to assist this device to work (i.e. by a conversion belt). Also it provides ability of independent conducting for each combustion intensity inside the engine without influencing on the others, even on services (oil, cooling). It introduces a unique way in conducting this engine which utilises legends of the physical concepts connected with the circular motion the of bodies, by using the Kinetic energies and its benefit to overcome the high rate lost of valuable fuel energy in all the present advanced automotive engines and finally in actual use of computer.

- 1- This engine depends on many elements constructing its performance, fundamental physical concepts of dynamics, elastic characteristic of material, the best way of utilising fuel combustion and the best workable mechanical sliding design, these elements are put to work in association to produce better fuel utility output.

- a- The cylinder(s) has flexible piston, mounted in each wheel on the centre-side of wheel axis with central line angle($>45^\circ$) on its wheel tangent i.e. larger than 45° , a certain force on piston will urge it to deform and transfer part of this force to the wheel then acting like sway pocket to rotate this wheel due to moment resultant.
- b- The air-fuel mixture charged in pressured mode or in supercharging mode.
- c- The mixture charge will explode by timing spark plug, nothing will prevent this.
- d- The piston is placed in a plant position against the spark plug at ignition timing.
- e- There is one wall in the chamber has ability to move if urged by a force, that is the piston, to start to depress guiding explosion charge impact to be driven on it.
- f- The flexible piston in the cylinder is affixed by elastic compression push-arm (ductile spring) on cylinder base, any force impact or increasing it on this piston will cause the piston to depress to inner ward due to the elastic deflection of its elastic compression device connected with. It is by Hook's law of elasticity that means the displacement characteristic is proportional to its force in a straight linear mode. Part of this acting force on piston will transfer to the cylinder base via push-arm causing this wheel to rotate as has sliding periphery edges. This magnitude is in a plant design considering Modulus of Elasticity for push-arm.
- g- The wheel will rotate sliding the chamber's emission contents to exhaust zone.
- h- The principle used here is the same used for explosion concept inside a canon to through a bomb and how to re-fill automatic weapons by its emission's gases .

The displacements of these pistons are in different magnitude depending on each explosion charge occurred in their chambers since each piston's elastic push-arm playing a major part in the performance of this system, that is to provide the actual spacing on chambers relatively to the actual required work to be done by the engine in order to reduce the fuel consumption to be according to the exact needs of work.

Modulus of elasticity for each push-arm will play this major part in this system by using different magnitudes in each option even in one push-arm e.g. starting its top (beneath the piston directly) in a sencitive elasticity to let any primer increase of a chamber(s) under pressure(the air-fuel mixture at explosion) to effect on its piston to guide the primer impact to be directed then to drive the whole explosion impact at the piston(s).

This is a similar to that old concept still used in fabricating cylindrical gun canons.

The magnitude of modulus of elasticity for a push-arm may be changed gradually directed to the inner ward i.e. to cylinder base as plant, to increase the resistance in

a design connected with the whole engine features, by using different cross sections in ductile spring under pistons; to let more effective impact on cylinder base then to on the wheel(s) then producing moment (or as momentum) for rotation.

That is explained way the cylinders in this engine have more related lengths .

The pistons will work harmonically inside the engine due to their freely way of fixing them inside wheels with independent conducting feeding supply. This is regarding an important physical concept(a rotating object will need less power to keep on in its dynamic move or even if accelerating it than that primer power used first to change its static to dynamic mode as a relation proportioned inversely with its rotation speed)

This in considering all data, type of fuel, and situation of engine in various loads.

2- For the interrogation on how the aerodynamic effect is existing from exhaust gases by using specific outlet opening .

It is by applying that fundamental concept of (Bernoulli's principle) and escaping balloon concept as essentially used to produce aerodynamic force in any rocket !

The chamber(s) in the wheel is to be assumed as a rocket's chamber that contains pressured gases emissions(from fuel burnt) to expel from a rocket back side via a designed outlet (opening). This would be guarded be wings to change diameter

or the angler direction of this opening to effect on escaping gases to control speed or direction of this rocket(same control has been used in advanced fighter air-jet).

The same thing is applied (relatively) on graded specific exhaust openings fixed on the Case around the wheels periphery at starting exhaust portions of this engine.

That is to construct affixed wings (or moveable by control) on the Case periphery around the wheels at a starting of exhaust zone to inverse the aerodynamic effect.

These out lets which shaped by fixed wings will utilise the exhaust energy power.

Since chamber(s) in this rotating wheel is containing pressured gases due to previous explosion of air-fuel mixture (occurred before by spark) besides existence of Back Off force from the depressed (mode) elastic spring which is fixed beneath the piston to react, but in dual opposite directions ; on piston and cylinder base in the wheel to react also when chamber pressure starts to reduce at gas penetration.

The place of these openings in Case starting where exhaust gases are free to expel.

The openings orifices, angles, (wings shapes) and the places all will subjected to a plant aerodynamic design to act intensively at the exhaust zone outlets considering all other data e.g. the dimensions cylinder, the wheel, back off elastic springs , the

fuel mixture compression ratio with the whole engine design and its loading.

The chamber structure will be under escaping balloon concept same that used for a rocket; to be reflected then to act on its rotating wheel to add more power, more torque on engine output freely since the design provides this unique ability.

This explained how the aerodynamic force of the exhaust gases could be utilised to add more power over the conventional fuel combustion power on output directly.

The simplest example is a Rolling Fire Works Wheel rotates by reactions of lighting these Fire Works mounted on the wheel periphery and so by using this principle.

Exhaust central outlets placed to face the chambers and to be under the effect of aerodynamic exhaust gases when expelled from the chambers by a design starting (with rotating direction) by a small opening of sharp designed angle on its wheel tangent on the inner wall of wheel Case then followed by others in plant distances with gradually increasing in their diameter and/or in a tangent angle around the wheel periphery, in the beginning of exhaust zone; to have actual dual effect.

First, increasing the speed of expelled gases (via small holes) to produce reflecting aerodynamic force acting positively on wheel. While changing the direction effect during the wheel rotation by positions change of outlet holes and angles.

As to inverse a centrifugal turbine principle, when there is rotating periphery has plant wings surrounding its inner space with a pressured air comes via a pipe to be urged to drive outwardly in diagonal certain direction crossing these wings.

The fast air will act on these wings while discharging out ; aerodynamically forcing the wings to move rotating the whole periphery on the same direction !.

How about these wings are in affixed periphery as the Case of this engine, and the puffing device is able to rotate by a reaction , then it will rotate, same as the inner freely rotating wheel, containing chamber(s) of exhaust pressured gases urged to expel but aerodynamically to force the wheel to rotate.

How specific is this movement !? That is depending on how to exist and invest this phenomena in a design subjected to the whole mathematics calculation of the above mentioned data (by using computer formatting programmes !) .

- 3- The interrogation about the engine performance as combination of piston, rotary and turbine with additional influence of physical positive effect due to movement of elements inside the engine. This design includes fundamental physical concept those which used in inversely proportion with an available factor in any engine that is

the 'speed' to have some Kinetic energies acting in a particular combined physical criteria to be utilised for the benefit of the engine output depending on conducting way of this system.

By employing Newton's Laws of Motion, Gravitation and Centrifugal concepts to be implemented in this engine design same as used in astronomy's legends.

The piston and its chamber (actual piston cup mass) are placed in the open side of a cylinder in the wheel(s) near the circumference. This cylinder(s) is placed in a position to have an axis making a wide angle with its wheel tangent to let a use of centrifugal influence to employ its resultant effectively by choosing an angle larger than 45 degree . The piston(s) will be under the effect of combustion force rotating the wheel, in the same time at high speed to be assumed as an attraction force on the piston(s) which is moving in this circular zone of wheel(s) periphery directing to its central axis, while the elastic push- arm beneath piston(s) urging to push it outwardly by transferring the centrifugal effect of the wheel fast rotating on the objects placed on its circular zone. The rotation speed producing this centrifugal effect which is as known will proportion inversely with the opposite force as it is here the combustion force (attraction force to the inner zone) on piston(s) which is consecutively occurred in the chamber(s). The force of pressured emission will laterally reflect any force acting outwardly on its flexible piston according to the concept of how pressured balloon could reflect a force (by gas elasticity) back on the same direction i.e. on the piston again. But since each chamber(s) is mounted on centre side place of the wheel the final resultant will act on the wheel rotation by accessing additional moment on it. As the angle of the cylinder is considered.

That means also the actual expansion of chamber space will be deducted besides that concept of urging to balance the positions (as flexible) for all bodies which are mounted on opposite direction round a wheel in fast rotation, although there will be a certain force to keep the wheel in rotation but as minimum as required.

This means a deduction in said required internal combustion force in highly speeds or a rapid acceleration i.e. deduction in fuel consumption as if compared by the conventional systems .

How to use this combined physical criteria is by substituting relevant determined data of the engine design and specification of fuel used to built the mathematical equations to observe practically the certain magnitude rate of magnifying the fuel

energy on the output of the engine for a said fuel by physically utilising specific movements of elements inside this system as declared above.

However a perfect fuel power output occurs practically due to longer moment effect of pistons with wide torque effective angle on the crank(could be more than 180°).

Analysing the elements and the reactions :

After the instance of fuel combustion in this mechanical design and according to direct the powers occur simultaneously at fuel combustion in this discipline which employed natural physical concept powers to happen due to the particular places of chambers and by utilisation physical characteristic advantage of gases under pressure in chambers those result due to fuel combustion, reactions appeared as:

A- The pressured gases impact on piston, the power reaction of elastic flexible push-arm, would act on two ways. A part pressing the wheel to rotate, and a part acts to get back to its previous mod at the piston top point (upward dead point), as it is elastic push-arm that will be stayed in charge beneath the piston, due to chamber's combustion gases. It is the gas physical characteristic in a closed space, which will resist any force as gas elastic resistance to reverts (reflect) this reaction appositely, which will be back again on piston and since the back side of chamber is the Case circular wall (internal circumference of circular case cavity), which provides away for keeping it rotating smoothly (on constant fixed axis), keeping chambers in lock situation by the radian seals job, while the wheel rotates means keeping a lock chamber in power zone with constant pressure. This means keeping the longer impact effect of this power on Crank. This is the hydraulic reactions of chamber gases inside this engine & the spherical shape advantage in utilising the chamber pressured gas pad characteristics in this situation by consecutively investing of all physical powers effects happen inside this system to be concentrated on the chambers to be used positively on engine.

B- A losing of pressure due to gases penetration as gases start to penetrate when wheel chamber reaches the exhaust opening, will agitate the elastic strained piston push-arm (in static mode but depressed situation) attending to return back rapidly to its normal position, it reacts on two opposite directions (two sides), meaning on wheel and chamber gases to add more power on wheel for torque..

After the continuity of wheel movement and those powers effect, a new physical power happens after this instance due to the way of exhaust wings opening's

- B. The fuel spray system is a mechanical and/or electrical device with a needle valve which uses a simple principle of permitting fast air passing on small outlet opening of fuel to produce spray in this air as required depending on Specific Density of fuel which maintains in supplied by usual fuel pump(mech. or elect.).
- C. The necessary pressured air will increase due to driver paddle-managing system controlling feeding then speed of engine's rotation and torque power.
- D. The other accessories like oil pump and water pump and ignition distributor will rotate with the crank or as for the industrial design.

The overall work of power wheel units (as all) output with a remarkable rotation speed monitoring the ideal output of this engine could be changed not only by depending on increasing fuel discharge-pressure, it could depend also on other engine modifications for separating engine's part performance as auto-output.

CONCLUSION ,(of analysing additional potential energies):

(The maximum fuel power output that occurs due to a larger and longer pistons moment on the Crank, larger than recent existing systems,) with the effective angle of torque power (could be more than 180° -depending on the design).

After the instance of fuel combustion in this mechanical design and according to the direct powers occur simultaneously at fuel combustion in this discipline which employed natural physical concept powers to happen due to the particular places of chambers and by utilisation physical characteristic advantage of gases under pressure in chambers those result due to fuel combustion, reactions appeared as:

1. The pressured gases impact on piston, the power reaction of elastic flexible push-arm, would act on two ways. A part pressing the wheel to rotate, and a part acts to get back to its previous mod at the piston top point (upward dead point), as it is elastic push-arm that will be stayed in charge beneath the piston, due to chamber's combustion gases. It is the gas physical characteristic in a closed space, which will resist any force as gas elastic resistance to reveres (reflect) this reaction appositely, which will be back again on piston and since the back side of chamber is the Case circular wall (internal circumference of circular case cavity), which provides away for keeping it moving smoothly (on constant fixed axis), keeping chambers in locket situation by the radian seals job, while the wheel rotates means keeping a lock chamber in power zone with constant pressure. This means keeping the longer impact effect of this power on Crank. This is the

required performance, not as the old principles which sucking the air-fuel mixture to the chamber and compressing it to be in pressured situation by the same piston with its way of losing power stroke and energy and relative slow acceleration. This means using of a jet technique in charging fuel, in this design which will give high performance as fast and better fuel burning as fast acceleration engine needs without limits related to other specifications.

4. The pistons in this engine connected with a relevant free flexible push-arm working as elastic resistance, using various resistant types depending on the engine design and power data occurs in the chamber at firing stroke, (types depending on fuel and design). This characteristic will apply good specifications, one of them is in reducing the sudden impact and will uniform stress of high power if occur on any piston(s). In away that these push-arms will transfer stresses of pistons uniformly on the Crank i.e. making the engine more smooth, reducing the vibration. The elastic flexible piston depressing will allow a good flame propagation (as combustion chamber space is automatically controlled), and the same reason to prevent detonation in chambers.

(The other advantage is to store some of it (the stress) to get use of it later (it will charge the piston elastic resistant). To use it in the same purpose i.e. transfers it later to positive reaction. The design will use the stand-still locked gases occurred due to fuel combustion upon the piston (in chamber); in away using the stored energy again to use it in the same direction (this happen fast, increases in high speed). The very next situation where the pressured gases (as stored energy) start to penetrate and release out (in exhaust stork), from the exhaust modified opening. The charged resistant push-arm adds extra power on penetrating gases as it starts returning to its regular form, more potential aerodynamic power exists by reversing this power with the elastic assistance via specified exhaust opening, (countering the theory of atmospheric flying principle as aerodynamic reaction).

The aerodynamic power of the penetration of the chamber's pressured gases from graded specific opening of exhaust; will act with more power on the wheel.

The analysis and conclusions could be confirmed by a sophisticated industrial laboratory using physics concepts and relative mathematics equations. → --)

These potential powers would act as a positive summation resultant reacting on piston causing more power added to fuel combustion pressure in chamber that reacts on piston as additional power effects on wheel to increase engine output.

The centrifugal natural power, reacts on free pistons (cup) since they are placed in the circular zone of rotating wheel ; to produce other reactions in high speed.)

These potential invisible reactions would be used with other analyses to minimise the fuel consumption by reaching an assumption situation between highly revolution speeds and depressing of piston(s) due fuel combustion instance, using data of push-arm resistance and relations of speed with dimensions and fuel, a computer formatting device analysing these criteria for each option, (Fig 18/25).)

The heat energy advantage (if used) would tight the flexible push-arm of pistons with heat increase especially in using a gas, hydraulic resistance, which could reduce the elastic movement of pistons (increase the resistance). It means reducing the sufficient capacity of charging air-fuel mix for the same output later with the continues of working time. This special design will agitate (at fuel combustion) these physical nature's powers to appear in a situation could magnify fuel output to be in the best potential power related with speed in this engine.

5. The oil services mainly depends on a natural constant principal with a special design that the oil flow will increase with the speed increase naturally not mechanically (as for conventional engines). This will be done by a centrifugal concept depending on the pads designed groove by feeding from central tunnel in Crank via relevant holes with relation to its distance from oil tank in engine. Magnified with speed increase, cooling the wheels and disposing pistons oil. This characteristic will lead to use the far pad in crank as huge oil pump by using high hydraulic specific grooves(trenches), for sucking oil from Crank to supply oil in Case for those seal masses needs and to cool Case in a best way. The usual oil pump could be cancelled if the oil tunnels in the case terminate at feeding (middle) oil tank of the central canal. The central canal in crank would not effect on the actual moment of inertia of the crank as its cross section is always circular.
6. The pistons with their free flexible arms will reduce the reciprocated movement to minimise it decreasingly (the distance between upper and lower piston's dead points); due to increasing of engine speed, in this design. This matter reduces displacements of main engine parts (pistons) movement while increasing speed,

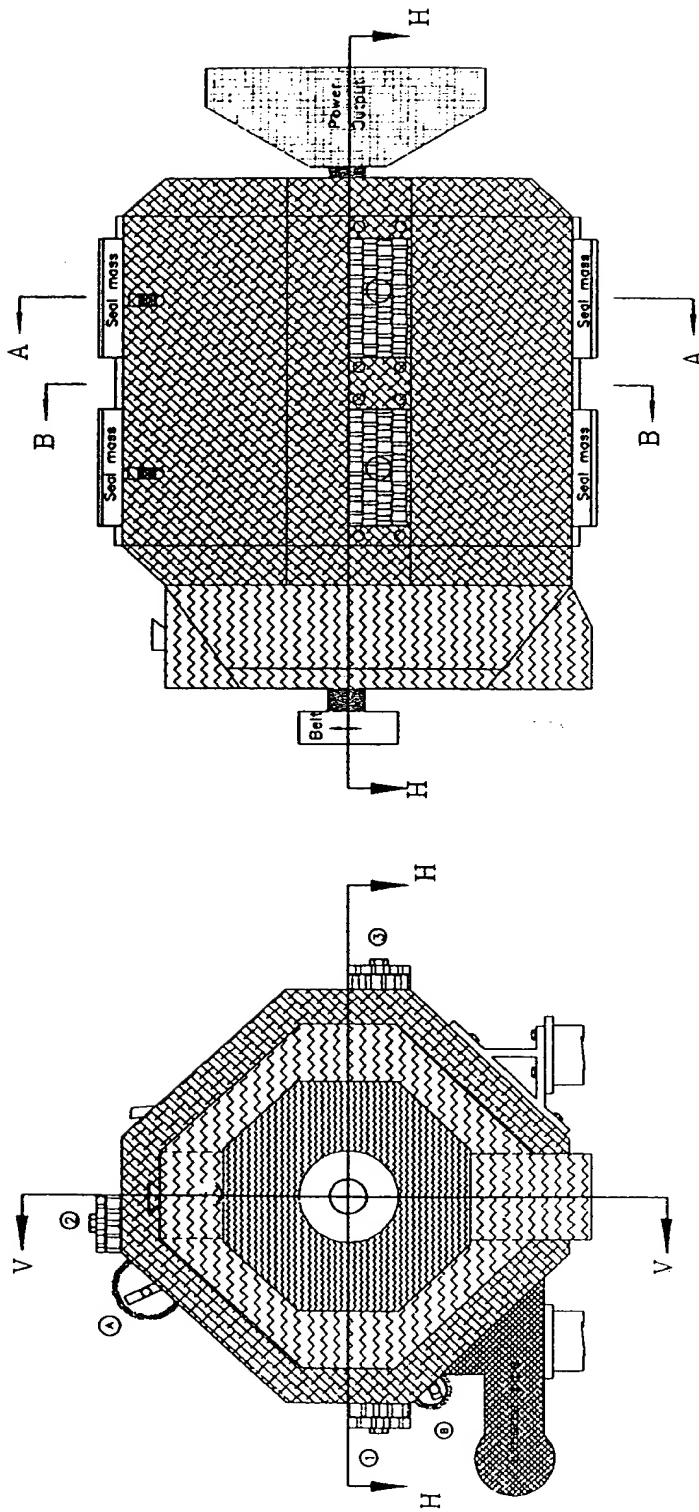
THIS ENGINE IN SUMMARY

SHIRWO S. :(Spherically-Sustained-Sliding / Harmonic-Hydraulic / Independent I. C. Intensities / Rotary - Reflected Reactions / Wheels / Operating_) System, is an internal Petrol combustion spark engine composing types of the recent known combustion principles (those separately used in automotive power) i.e. the piston, rotary and turbine, to perform all together in a compound system unit designed in integral sliding mechanism to achieve the best way in transferring fuel potential combustion energy to automotive power, with minimum power lost inside this engine which has flexibility to bear different ranges of combustion power intensities to be controlled to perform uniformly or independently but in harmonic effect inside the engine, using pre-compressed air-fuel mixture to be boosted to the engine, moreover this design is employing physical dynamics effects due to elements movement inside which appear at engine's work, to be utilised positively instead of losing them as a lost energy inside the engine, by employing techniques of using Nature Physical dynamic concepts to be implemented on these elements to utilise their effects for the benefit of engine output, to make this system depending on fuel potential chemical energy for internal combustion in addition to inside positive consequence physical effects to produce its final improved output, a system consisting many theories act in association to provide best fuel utility in producing automotive output power related to power-weight ratio, in the meaning of reducing said fuel consumption, this engine (Fig 25/25) comprising from a cylindrical Case 2 having one or many wheels 3, mounted and geared on a straight central (crank)shaft 6 inside the cylindrical cavity of Case 2 for rotation coaxial therein, the said wheel(s) containing at least one cylinder(of piston) 41 in centre-side perpendicular to crank axis, its central line makes angle on wheel tangent more than 45 degree as its one side opened outwardly upon wheel rotating direction facing cavity of Case 2, a piston 42 mounted inside the cylinder which has the ability of linear movement therein. the piston 42 top together with the cylinder 41 wall (bore) and inner circumference surface of the Case 2 defining a combustion chamber 1, the piston 42 is mounted to the other closed end of the cylinder 41 via a free flexible elastic push-arm 7, circular seals mounted with the Case 2 around the wheel 3 along its circumference 4 on each side edge 26, to isolate wheel performance as well as three or more of seal mass

ABSTRACT(Pt. 2nd Ed.)

An engine comprising a cylindrical Case 2 having a wheel 3 or more, mounted and geared on a straight central (crank)shaft 6 inside a cylindrical cavity of Case 2 for rotation coaxial therein, the wheel(s) contains one cylinder 41 or more in centre-side in perpendicular plan to crank axis, its central line makes angle on wheel tangent more than 45 degree, has one side opened on outwardly wheel circumference facing cavity wall of Case 2, a piston 42 mounted inside the cylinder has the ability of linear movement therein, top of piston 42 together with wall of cylinder 41 (bore) and inner surface part of Case 2 defining a combustion chamber 1, the piston 42 is mounted to other closed end of its cylinder 41 via a free flexible elastic push-arm 7 has sliding rod device, circular seals 26 fixed around each side edge of wheel 3 on its circumference 4 adapted with the Case 2, to isolate wheel performance, as three or more of seal mass 19 in radial location on the wheel circumference 4 width at designed distances to guard stroke modes of each chamber 1 in which conducted consecutively in rotating by air-fuel mixture inlet(s) 20 via valve(s) 22, spark plug(s) 9, exhaust pipe(s) 30 and air puffing inlet(s) 21 at end of each exhaust stroke mounted all in Case 2, pre-compressed air-fuel mixture boosted or injected (fed) into the chamber(s) 1 and air puffed on chamber in exhaust zone from outside by using main accessories for air feeding (cylinder to store pressured air charging by compressor, pipes, and spark distributor adapted with the Crank), fuel sprayed into pressured air to arrange mixture by a device 20 before feeding chambers under control, exhausted gases expel via specific aerodynamic opening 30 mounted in the case, valves 21, 22 opened mechanically in timing against chamber(s) 1, by edge of circular metal pad(s) 17, two pad used for oil and cooling services coincide around (each) wheel 3 contain radius grooves to be fed with oil from central oil canal 24 by centrifugal concept in sucking oil to supply other seals, piston servicing of oil via rod pump 10 mounted in piston sliding push-arm 7 working by its movement, linking piston oil network with crank 6 via wheel oil intake on the crank, oil is cooled while flows back to main oil tank 35 with atmosphere opening, central oil canal 24 is supplied with oil from middle oil tank 34 which kept filled by oil from main oil tank 35, wherein many wheels are inside Case each wheel could work separately by its independent fuel mixture and air feeding devices to be controlled automatically.

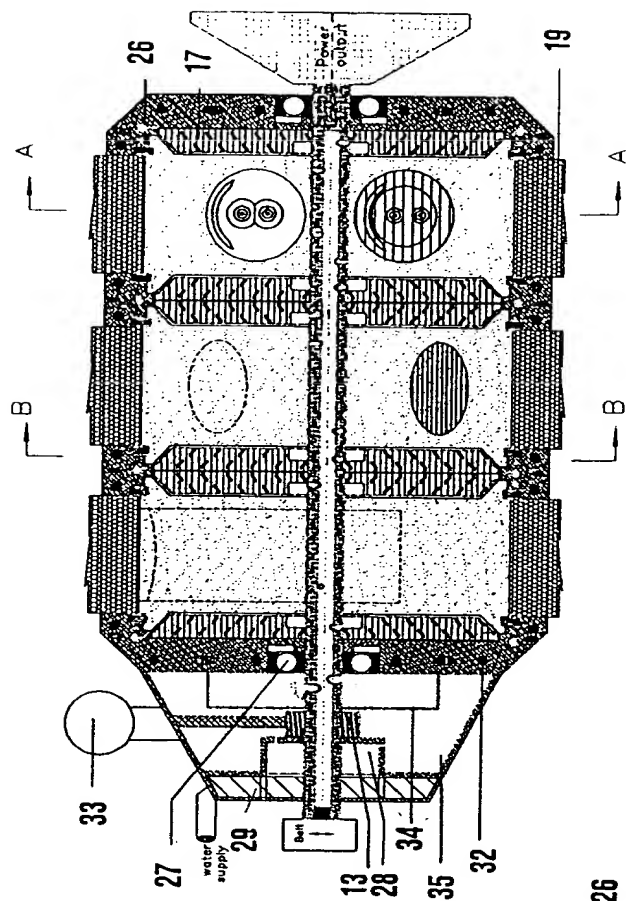
SHIRWO SYSTEM ENGINE
(Typical shape)



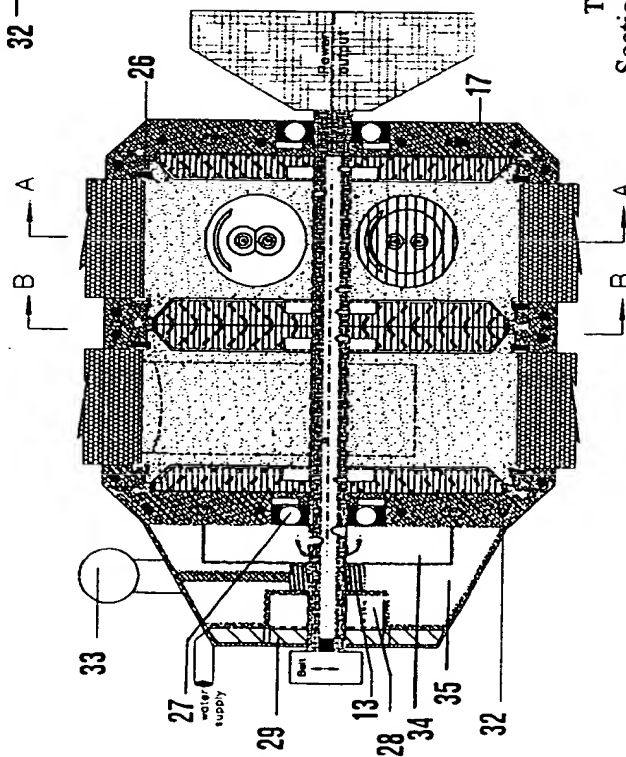
TYPICAL SHAPE -- SIDE VIEW

TYPICAL SHAPE -- FRONT VIEW

FIG. 1/25

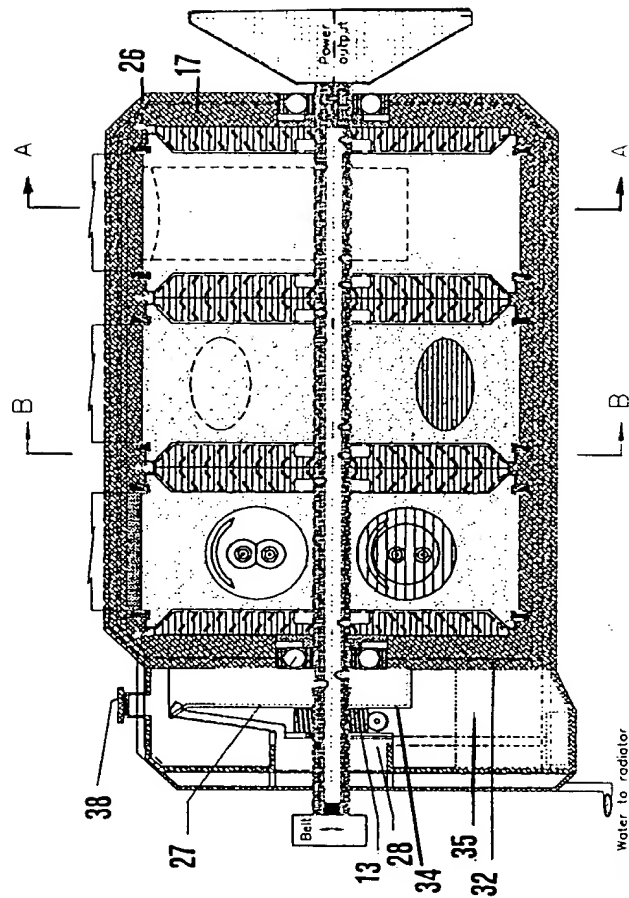


THREE POWER WHEEL UNIT
Section in horizontal centre line (sec. H-H)

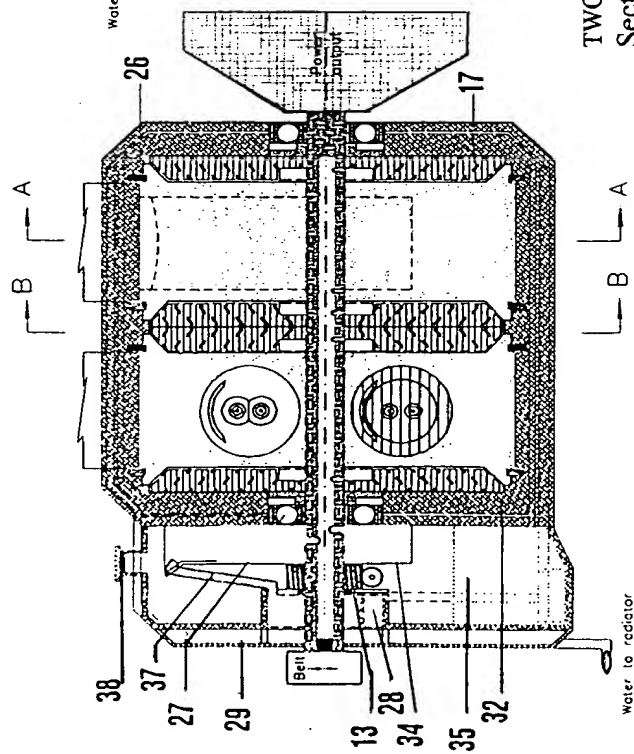


TWO POWER WHEEL UNIT
Section in horizontal centre line (sec. H-H)

FIG. 2/25

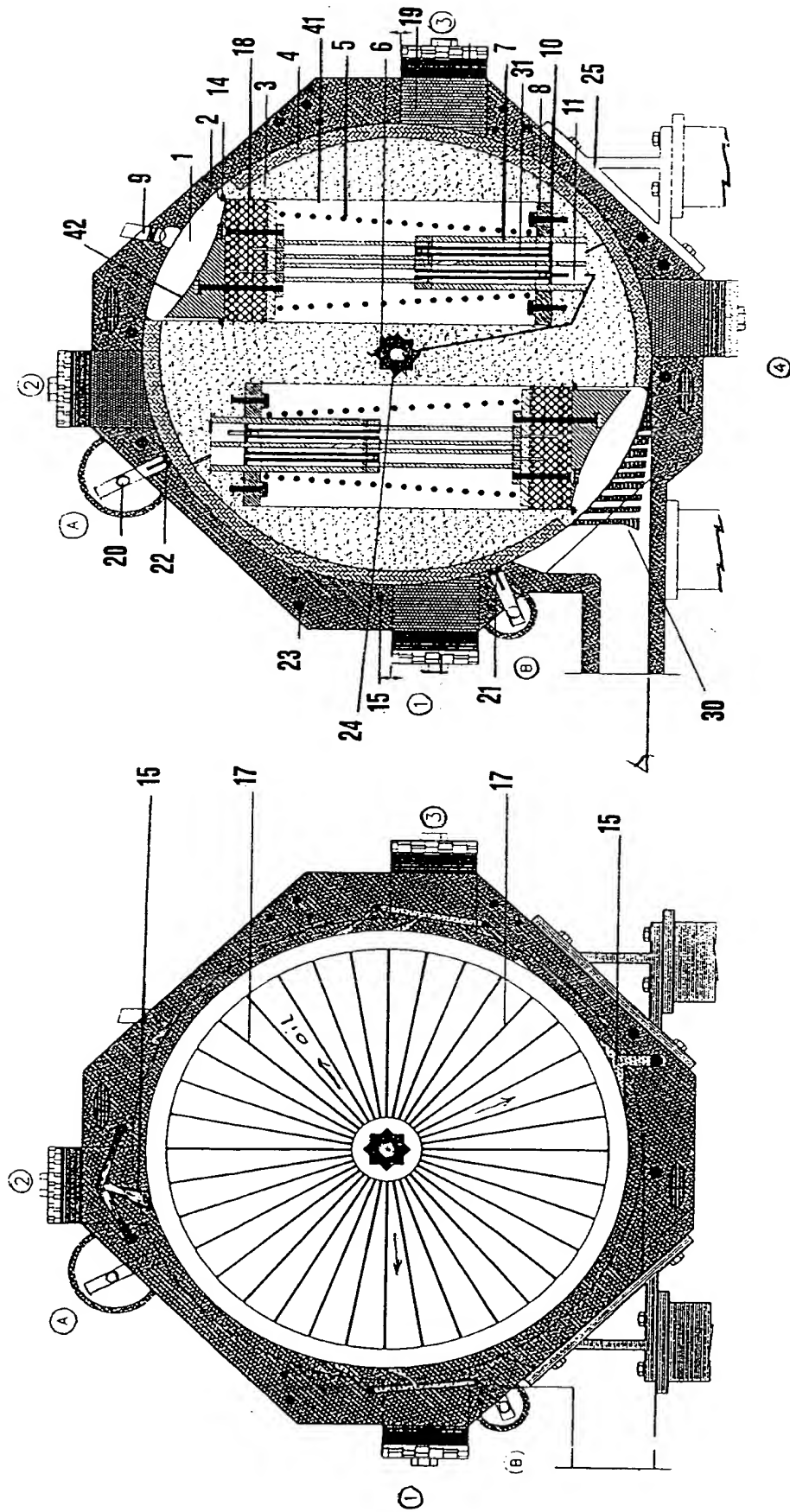


THREE POWER WHEEL UNIT
Section in vertical centre line (sec. V-V)



TWO POWER WHEEL UNIT
Section in vertical centre line (sec. V-V)

FIG. 3/25



SECTION A - A

SECTION B - B

FIG. 4/25

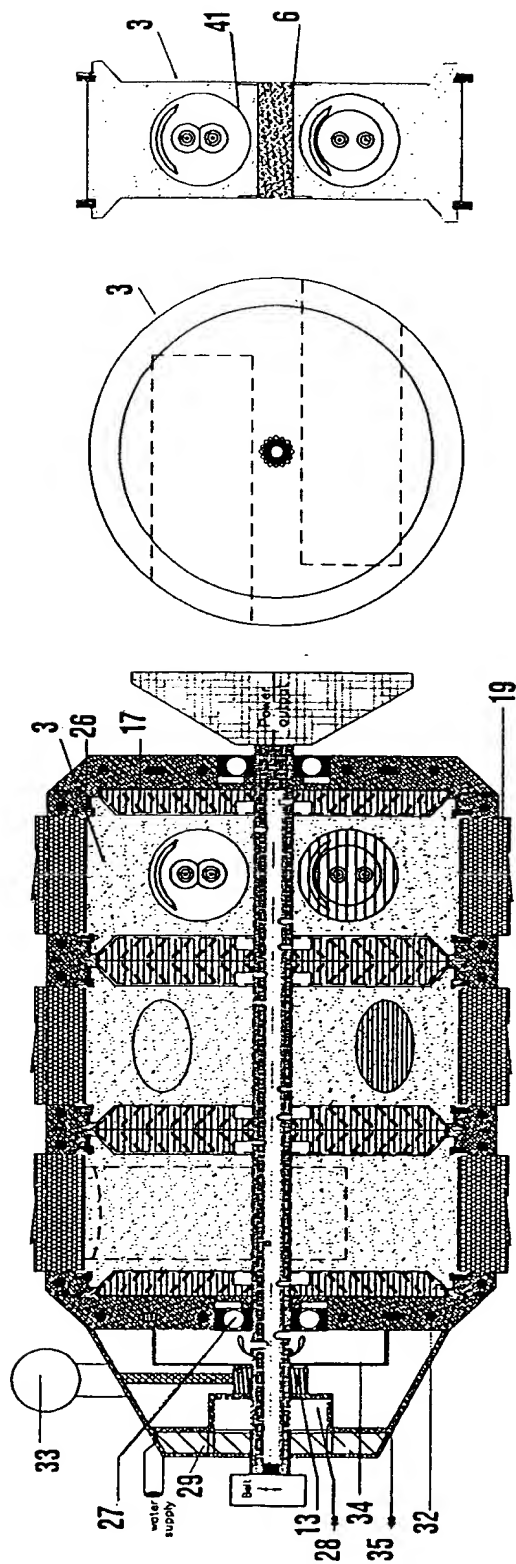
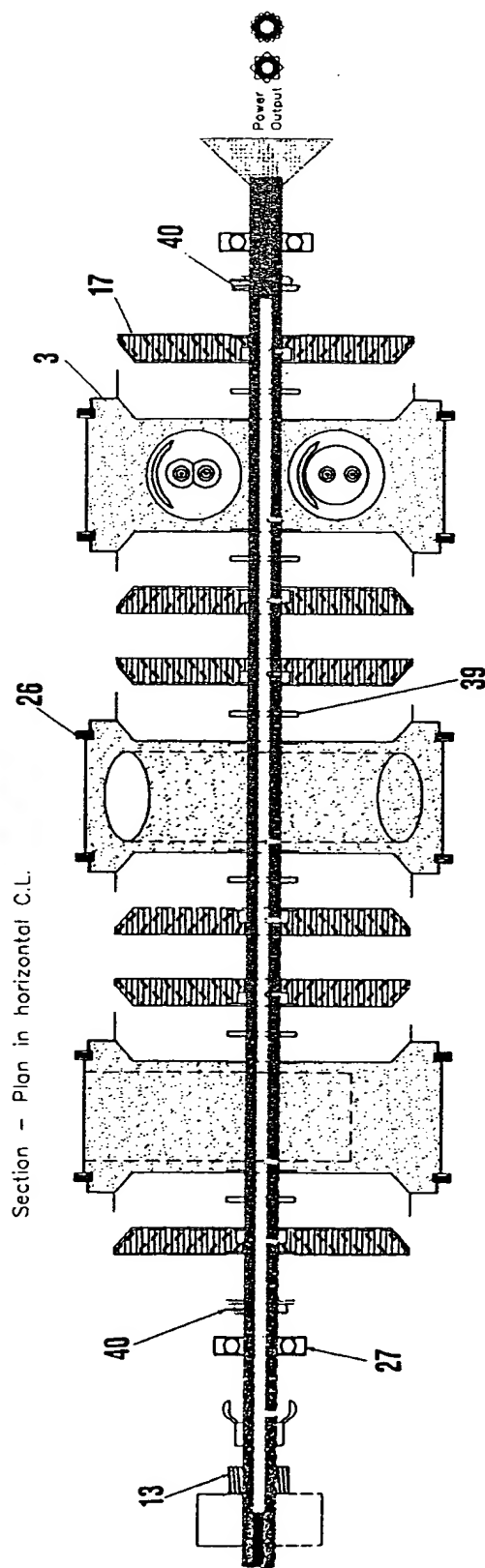


FIG. 5/25



ROTATING PARTS ANALYSIS ON THE CRANK

FIG. 5/25

NOTE
(Crank and oil inlet hole in crank as per each part are not in scale)

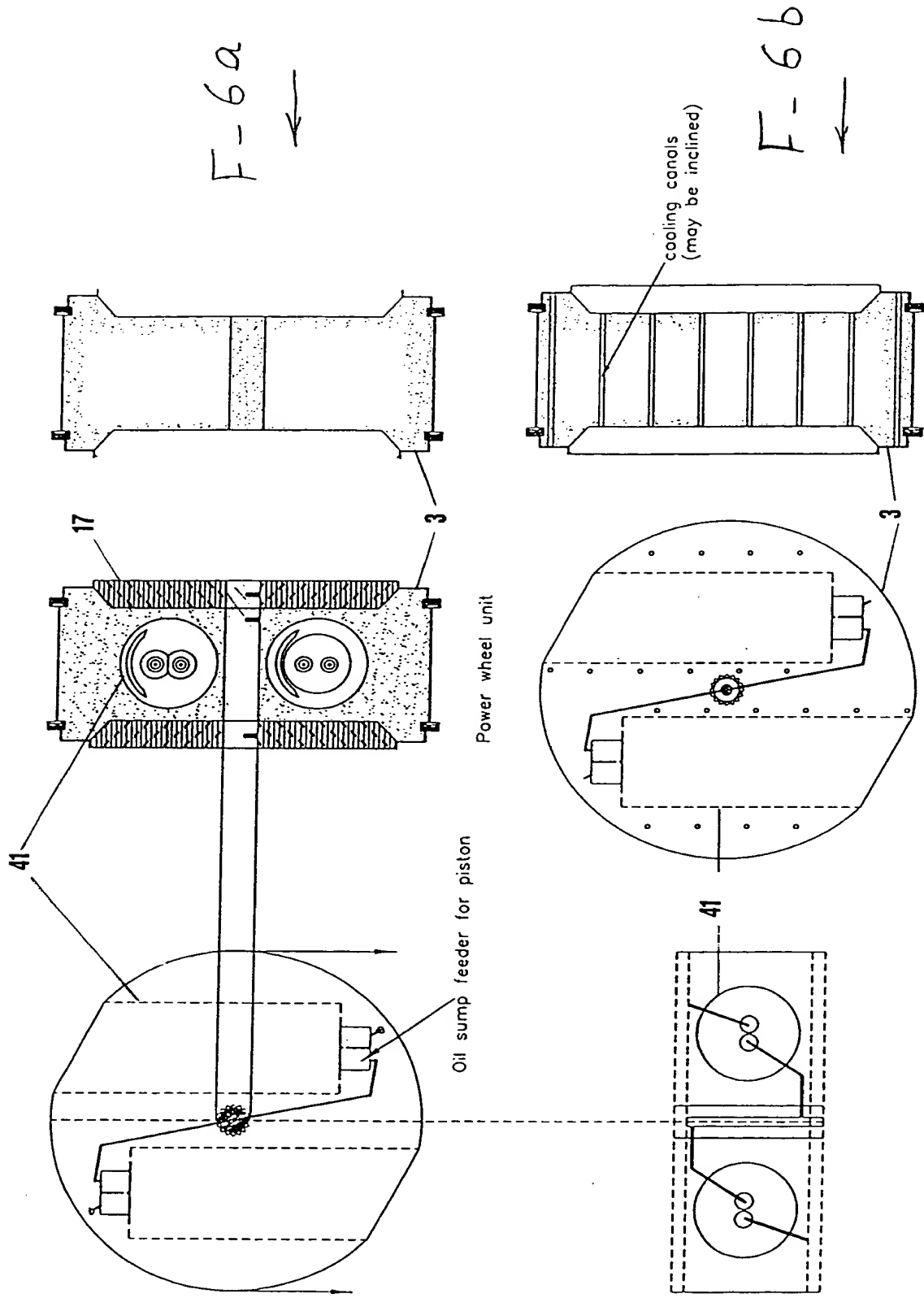
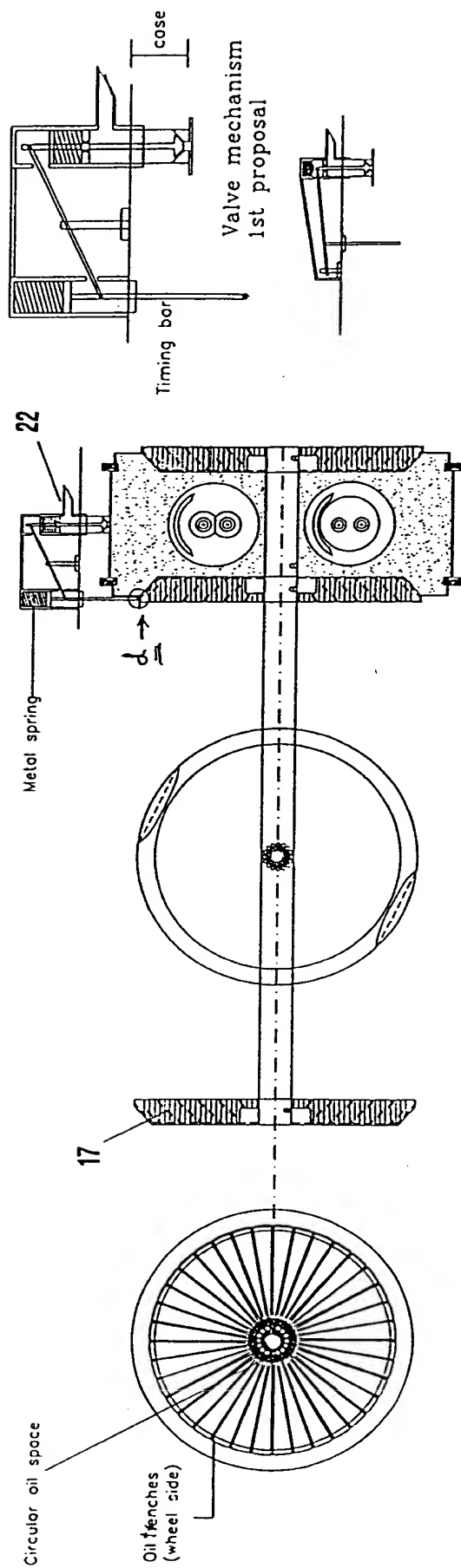


FIG. 6/25

PISTON INLET OUTLET OIL SYSTEM

Proposal for additional cooling oil holes in the wheel

FIG. 6/25

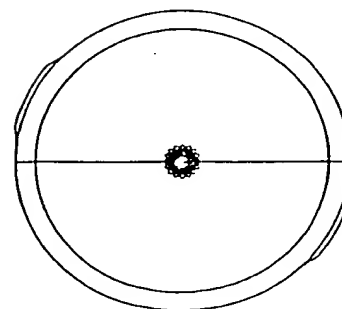


Cooling lubricator pad
(Detail 17)

1st proposal of timing system
for valve mechanism
(Lower points pad circular edge)

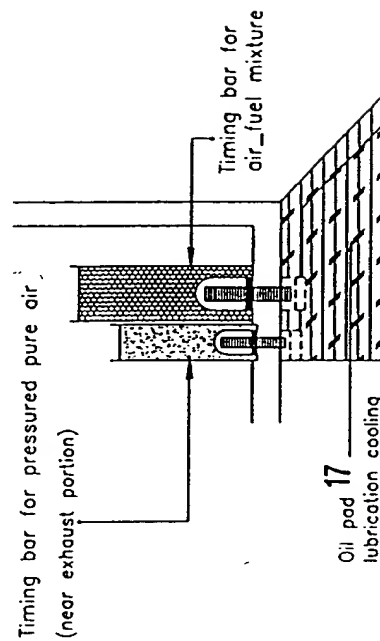
F-7a

F-7b



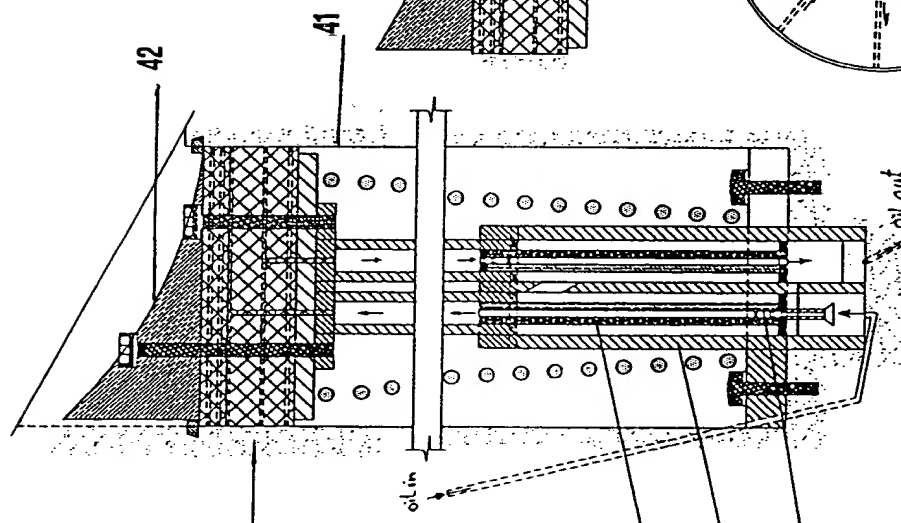
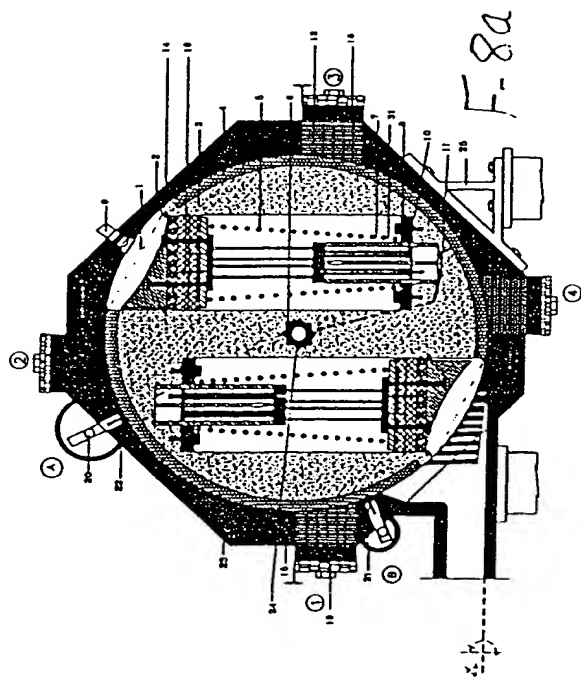
2nd proposal of timing system
for valve mechanism
(Higher points pad circular edge)

F-7d

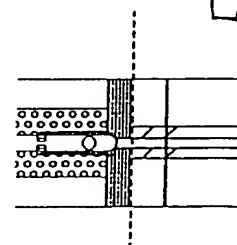


one pad - two valve timing system - δ
(Typical performance)

F-7e



- Solid piston lock ring
 Piston gas seal
 Piston oil seal
 Piston lubrication seal
 Piston lubrication seal
 Piston oil seal
 (As particular in piston)

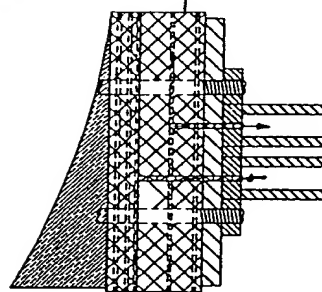


DETAIL 22d

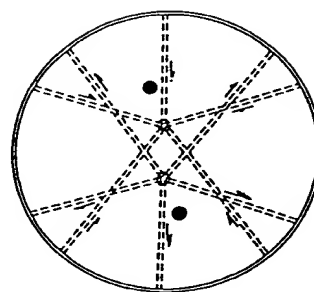
F-8d

TYPICAL CYLINDER_PISTON

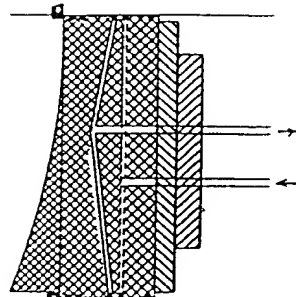
F-8b



PISTON OIL CANALS DISTRIBUTION
Scale 1 : 1.5



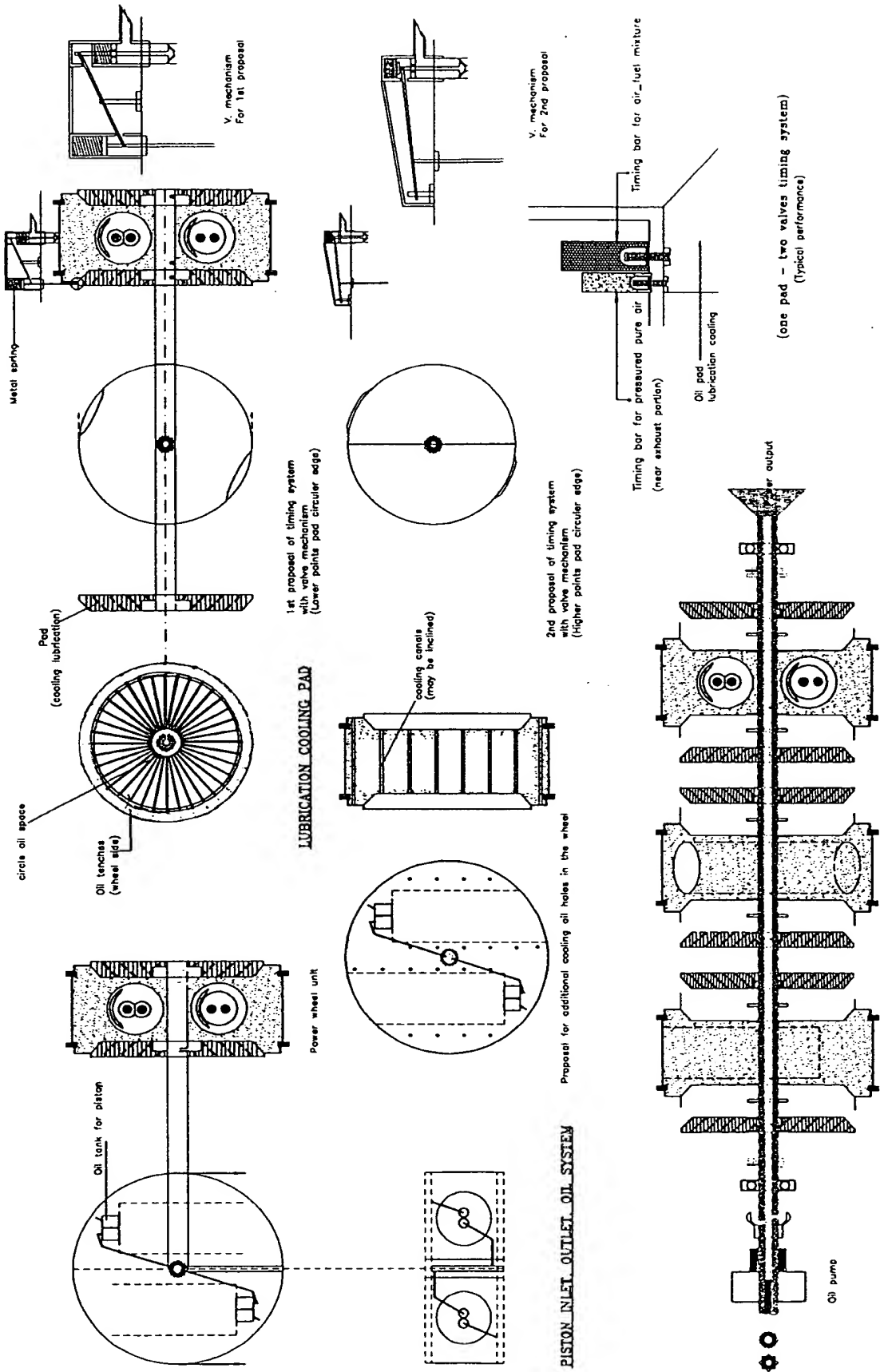
F-8c



Proposal 2
For the piston, lubrication

F-8e

FIG. 8/25



NOTE
(Oil inlet hole on each port It is not as per scale)

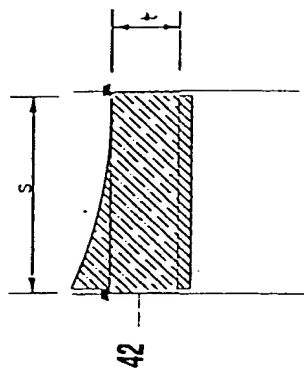
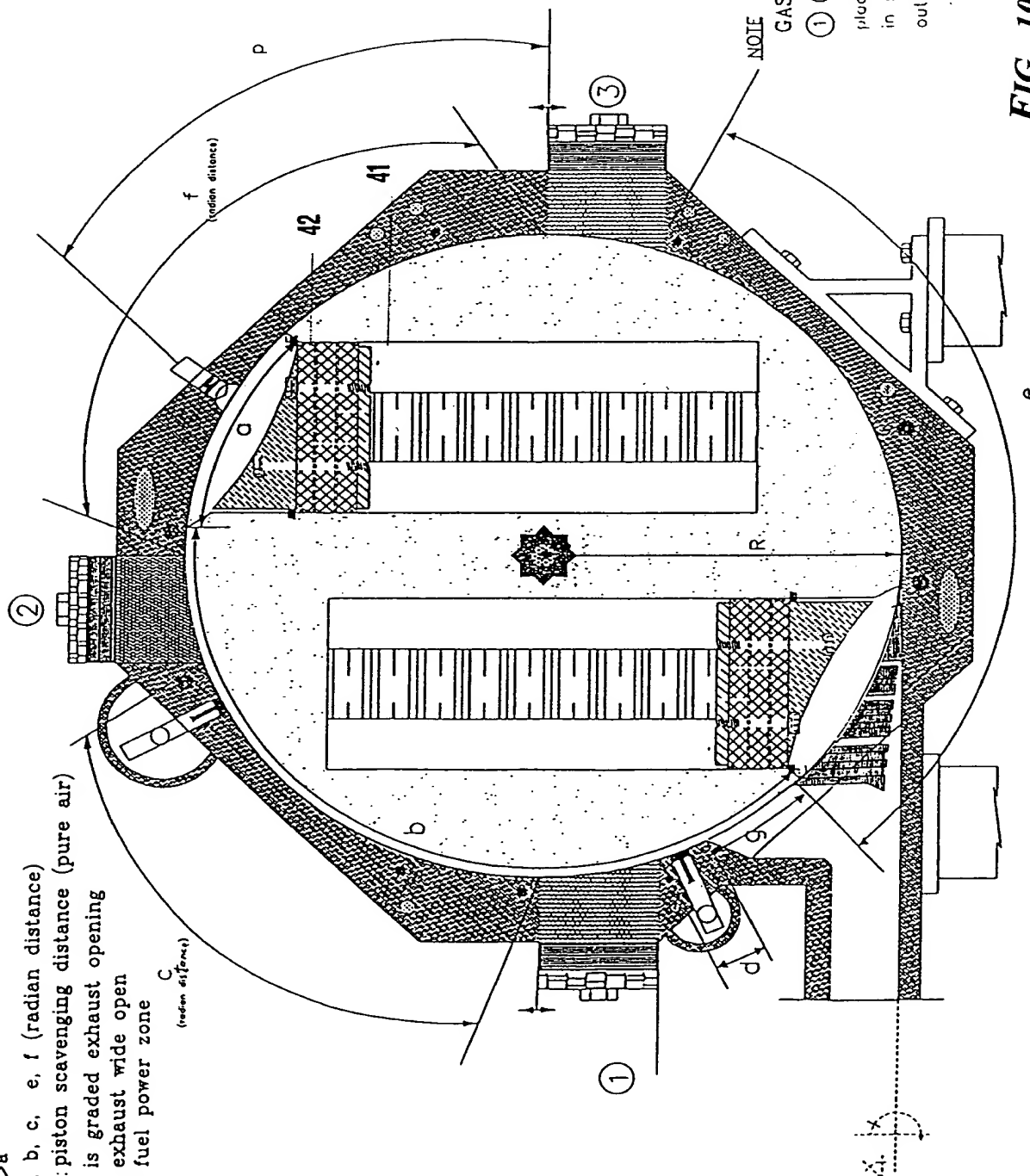
ROTATING PARTS ANALYSIS ON THE CRANK

FIG. 9/25

$b > c$
 $b > f + 1/2a$
 $d > a$

a, b, c, e, f (radian distance)
 d: piston scavenging distance (pure air)
 e is graded exhaust opening
 g exhaust wide open
 p fuel power zone

C
 (radian distance)



t : hight of piston cap
 s : diameter of piston

GAS SEAL MASS

① ② & ③ Can be replaced in different

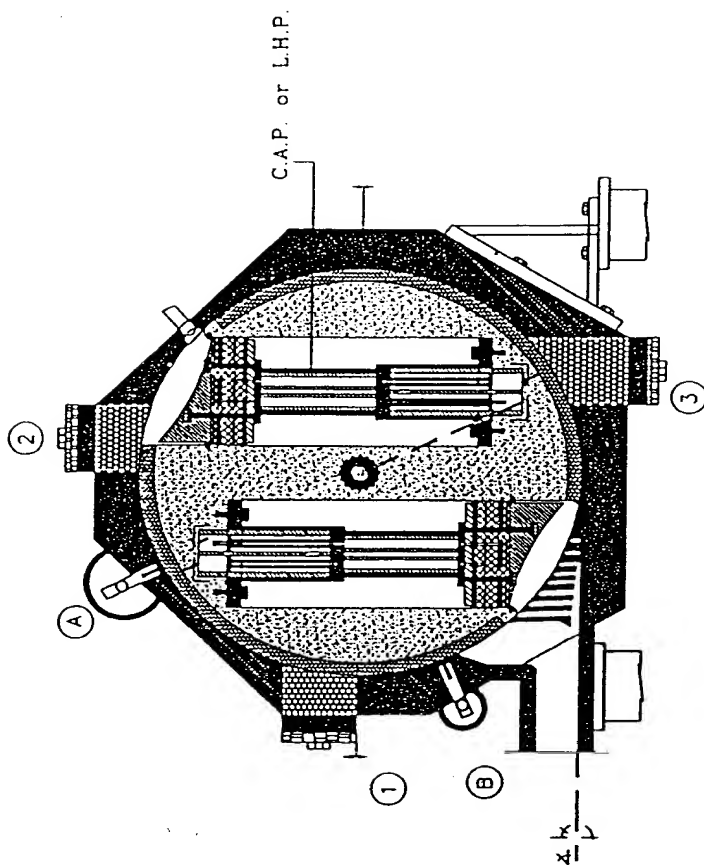
places as required and could be four pieces in suggested places depend on the outlet angle and other criterias.

FIG. 10/25

SECTION A - A

FIG. 10/25

C.A.P. : Compressed Air Device.
 L.H.P. : Liquid Hydraulic Device.

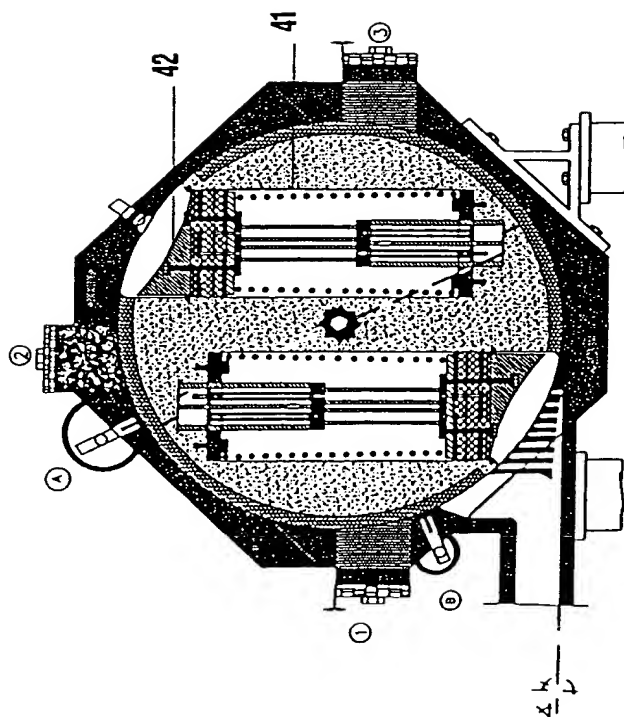


Hydraulic (device) push-arm modification
 Compressed air power modified
 or liquid (oil) power modified

FIG. 11/25

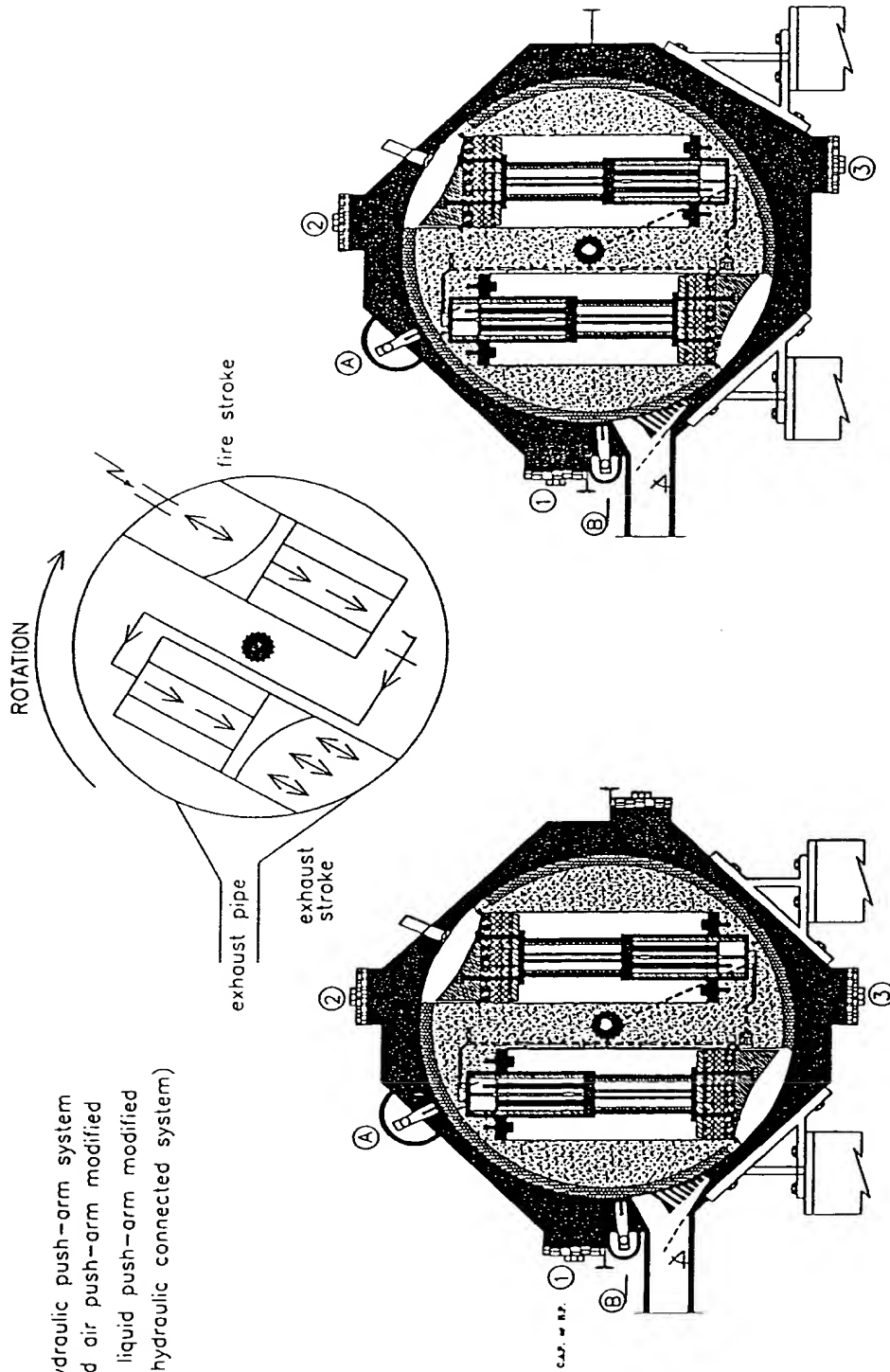
F-11 a

F-11 b



Spring push-arm modification

FIG. 11/25



Combined hydraulic push-arm system
Compressed air push-arm modified
or Hydraulic liquid push-arm modified
(two piston hydraulic connected system)

FIG. 12/25

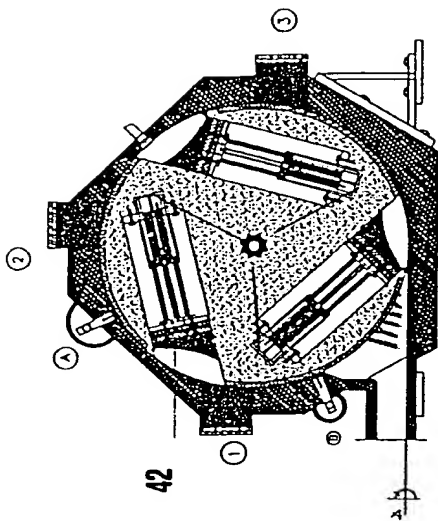
Proposed: 2

Proposed: 1

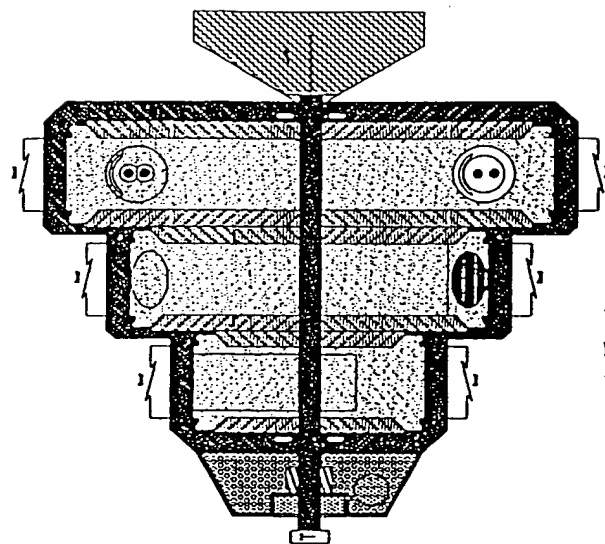
F-12b

F-12a

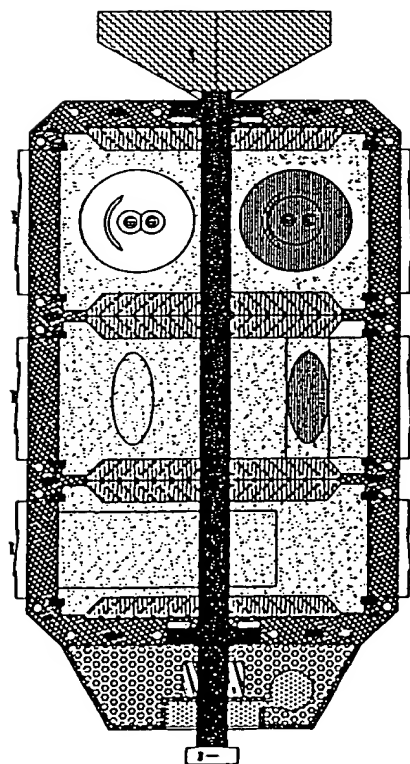
FIG. 12/25



F-13a



F-13b



F-13c

FIG. 13/25

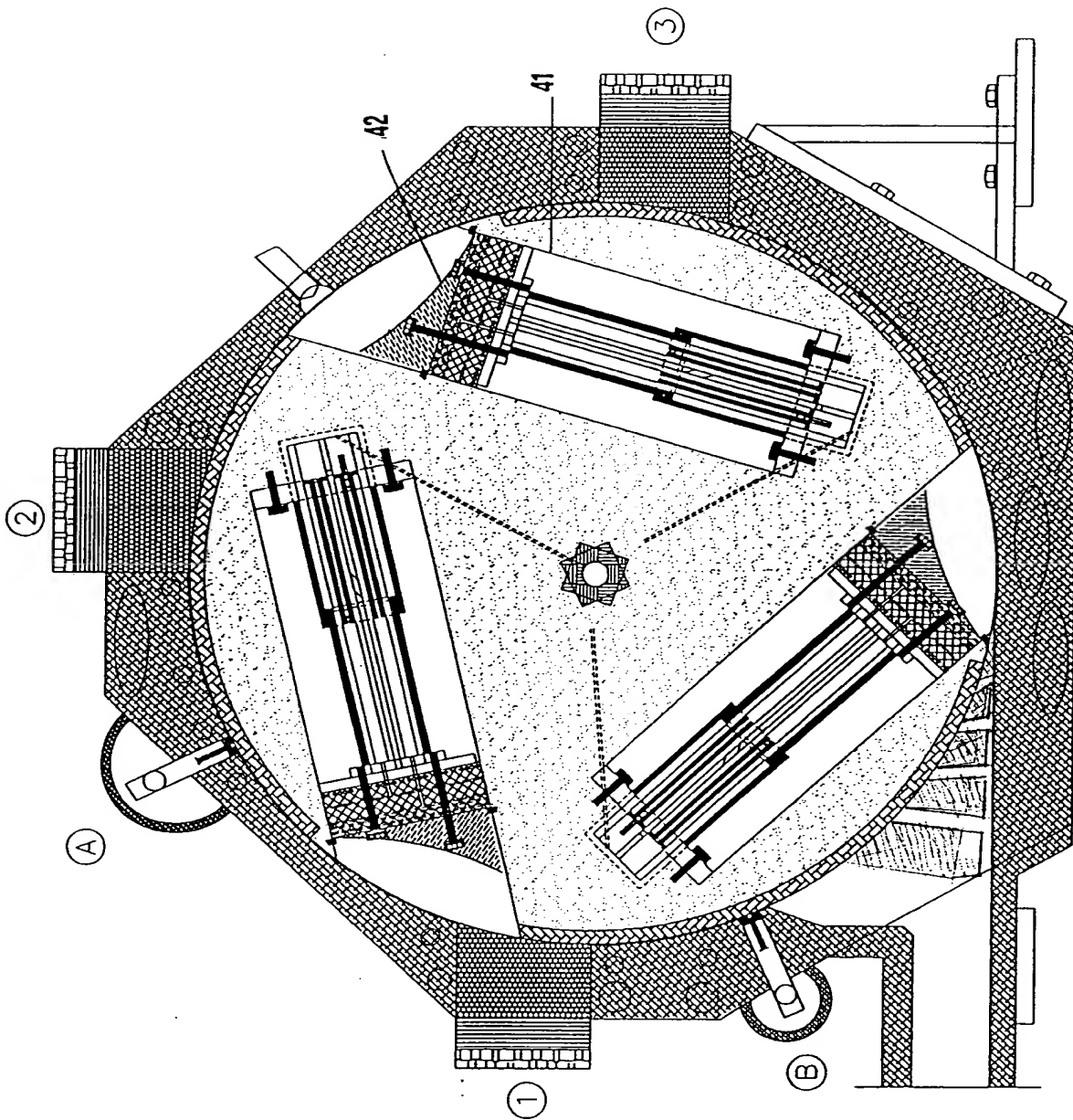


FIG. 14/25

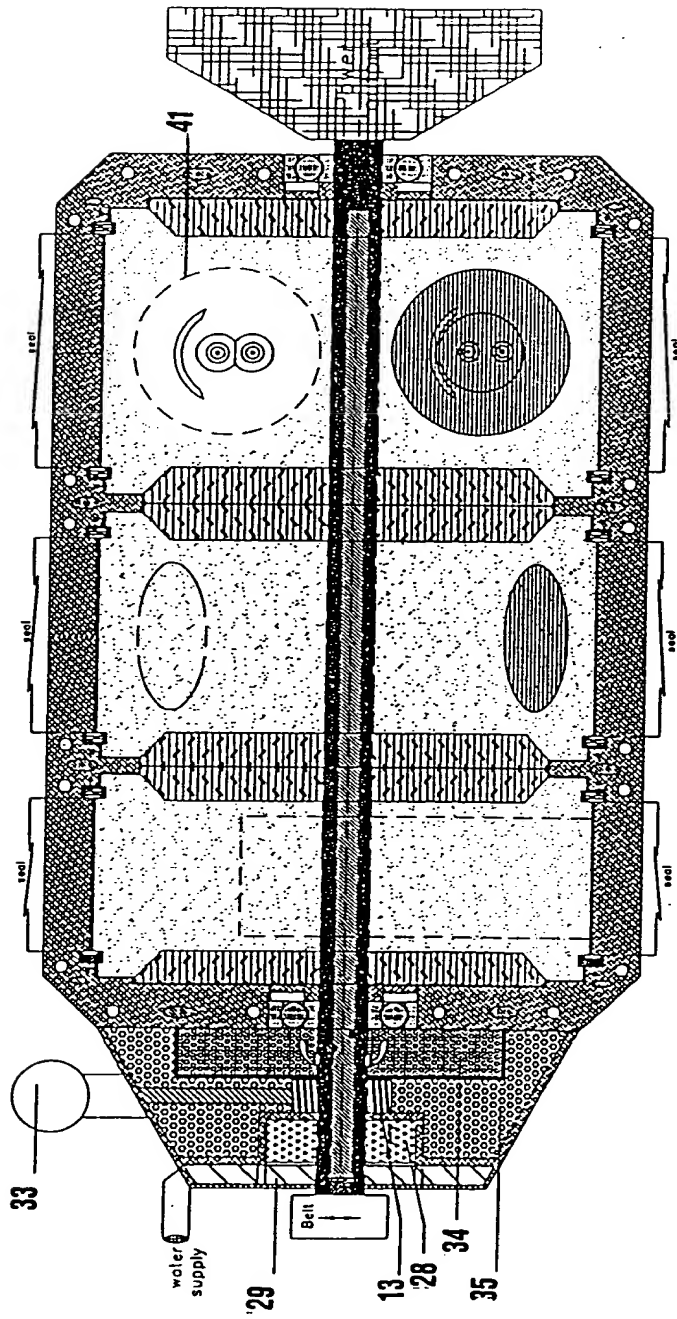


FIG. 15/25

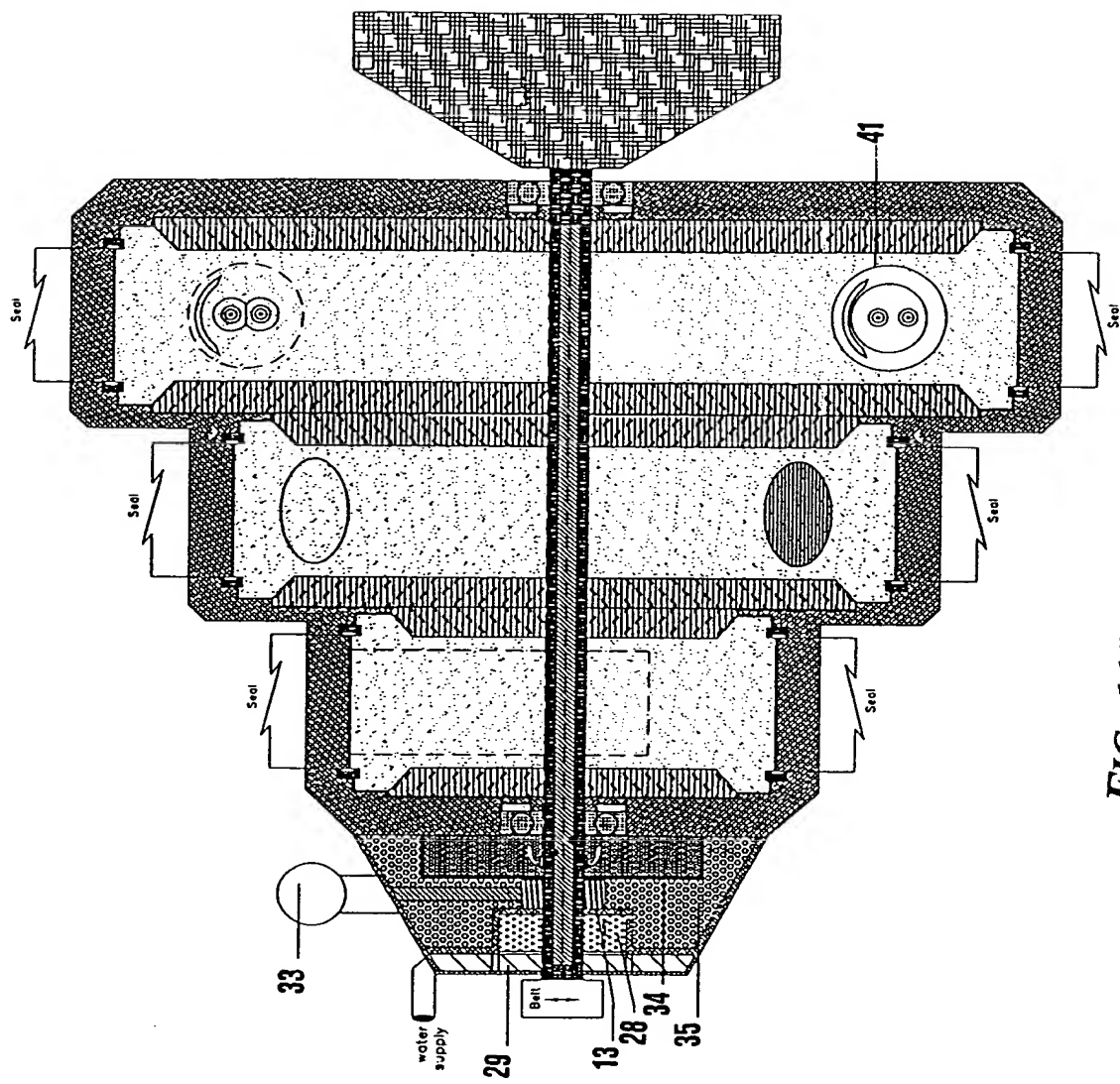


FIG. 16/25

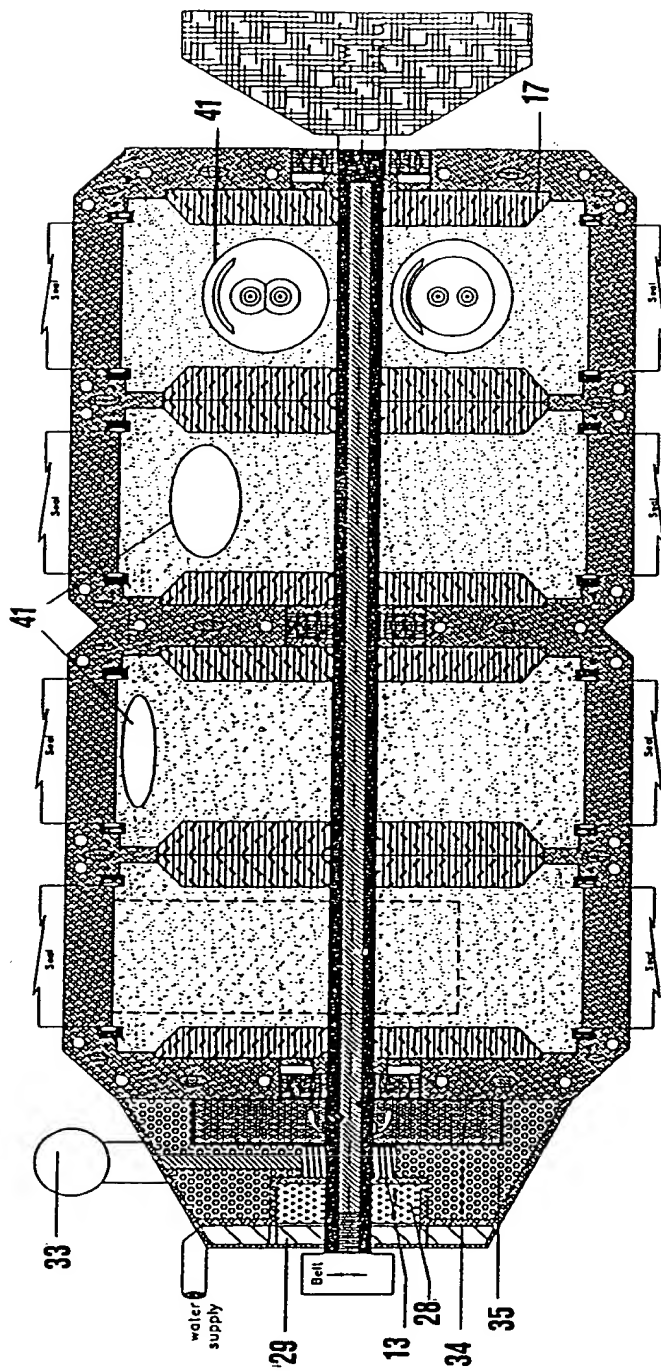
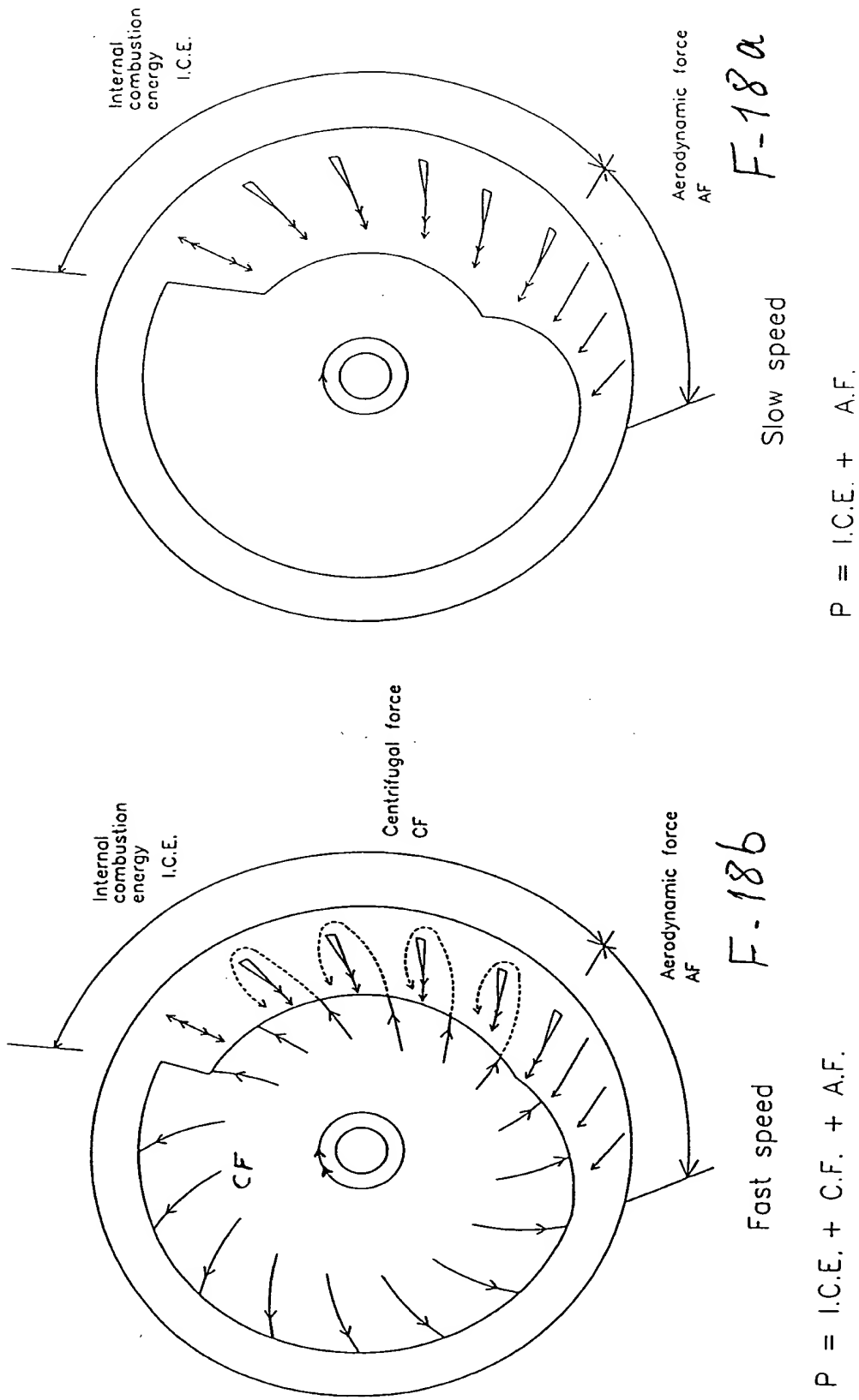


FIG. 17/25

DETAILS OF ENGINE FORCES ON PISTONS.



NOTE

Component elements are not in actual scale

FIG. 18/25

SHIRWO SYSTEM ENGINE TYPICAL ENGINE PERFORMANCE

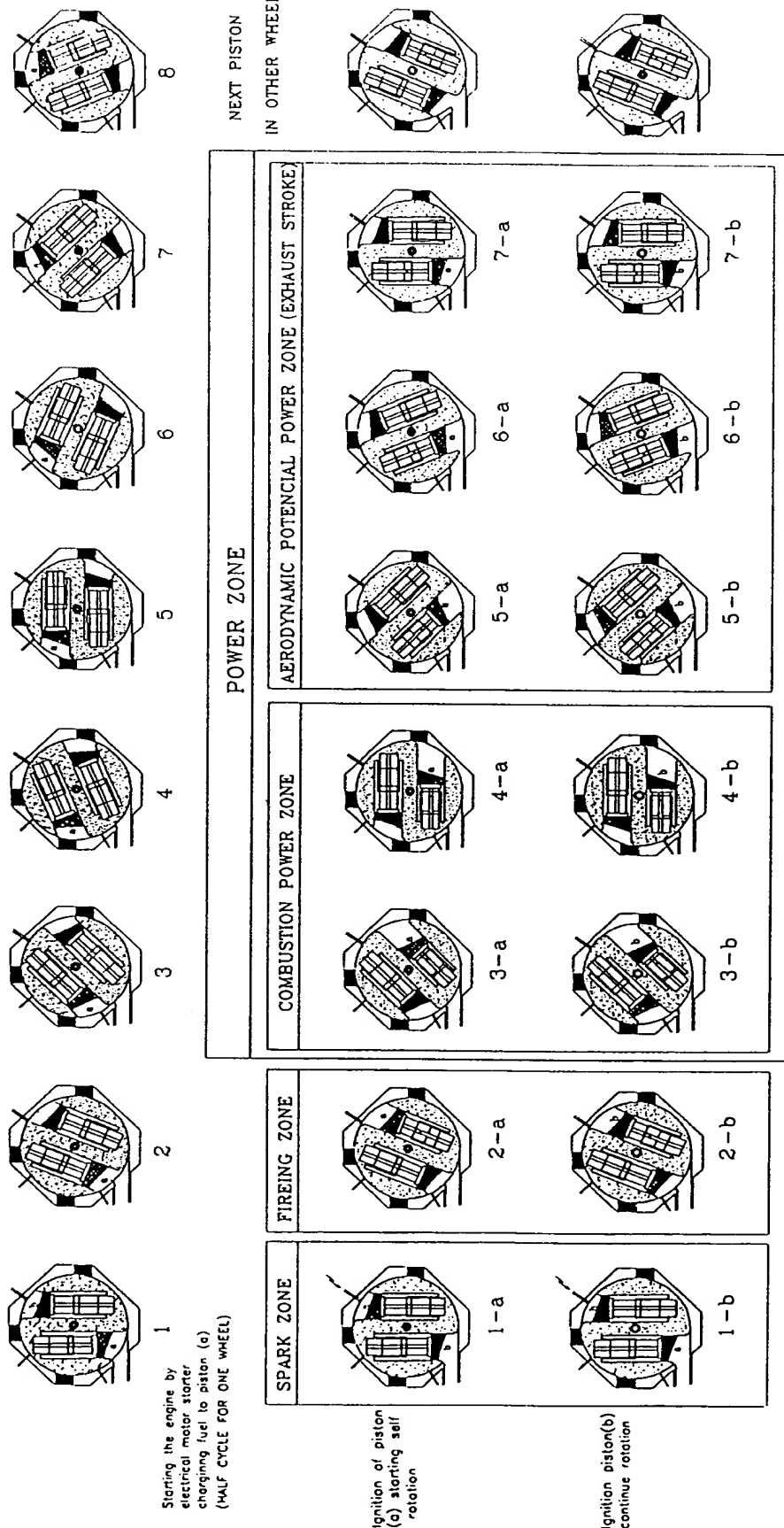
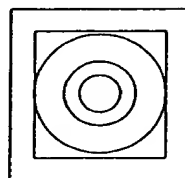
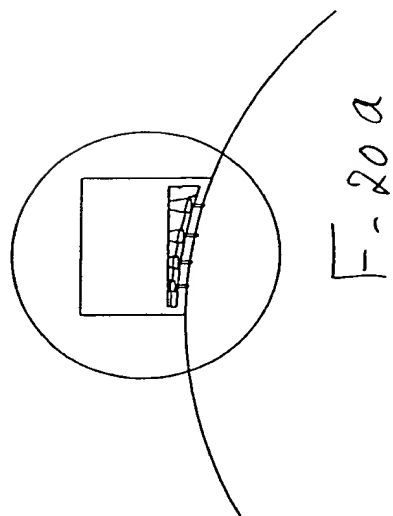
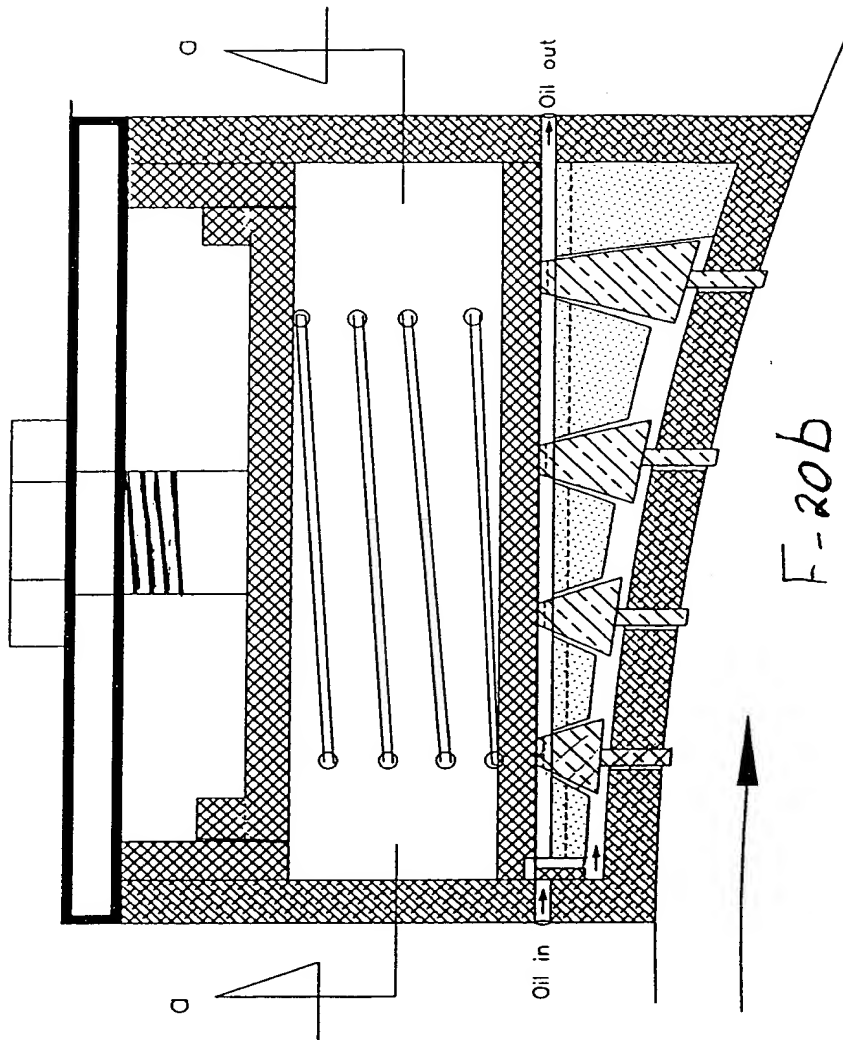


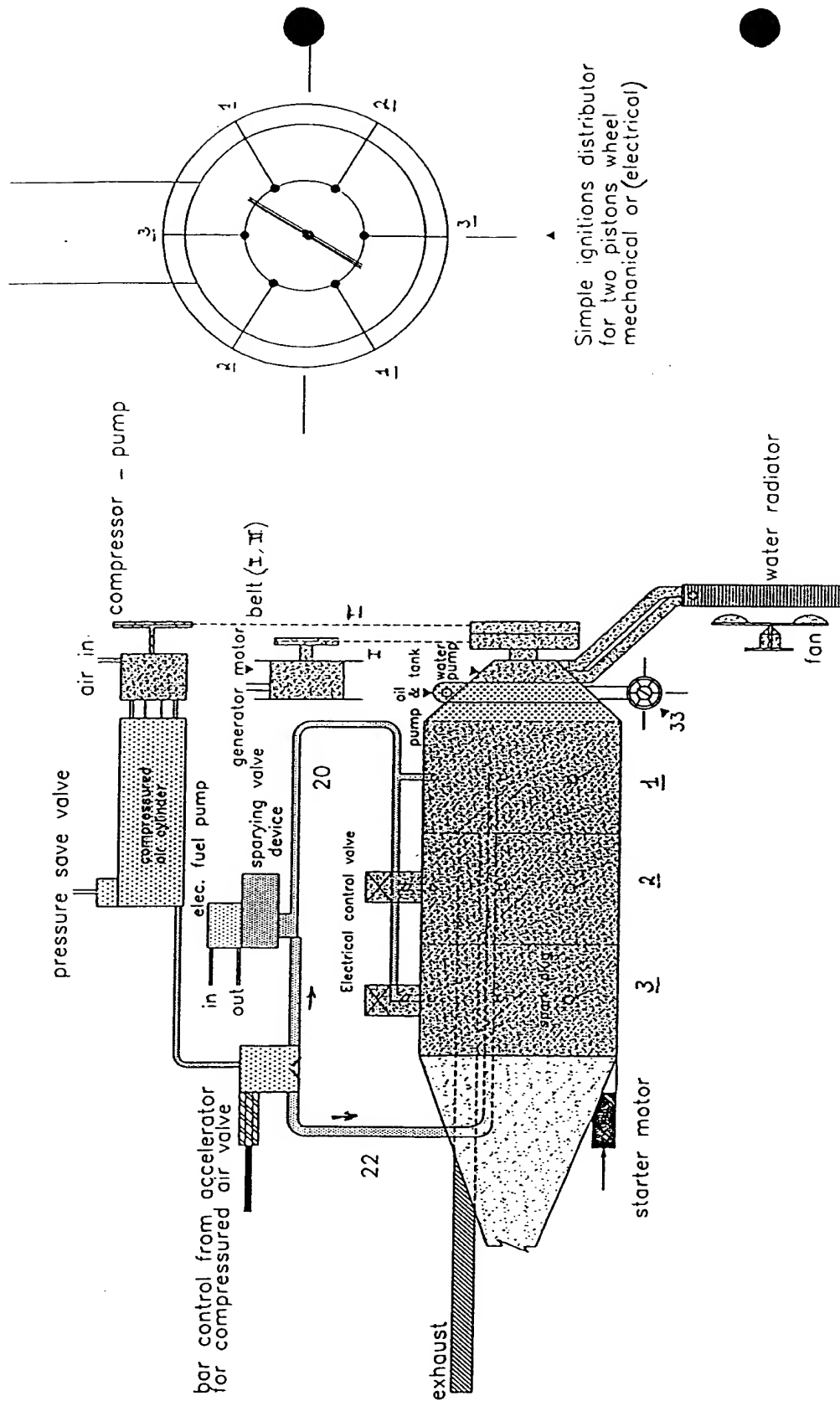
FIG. 19/25



Section a - a

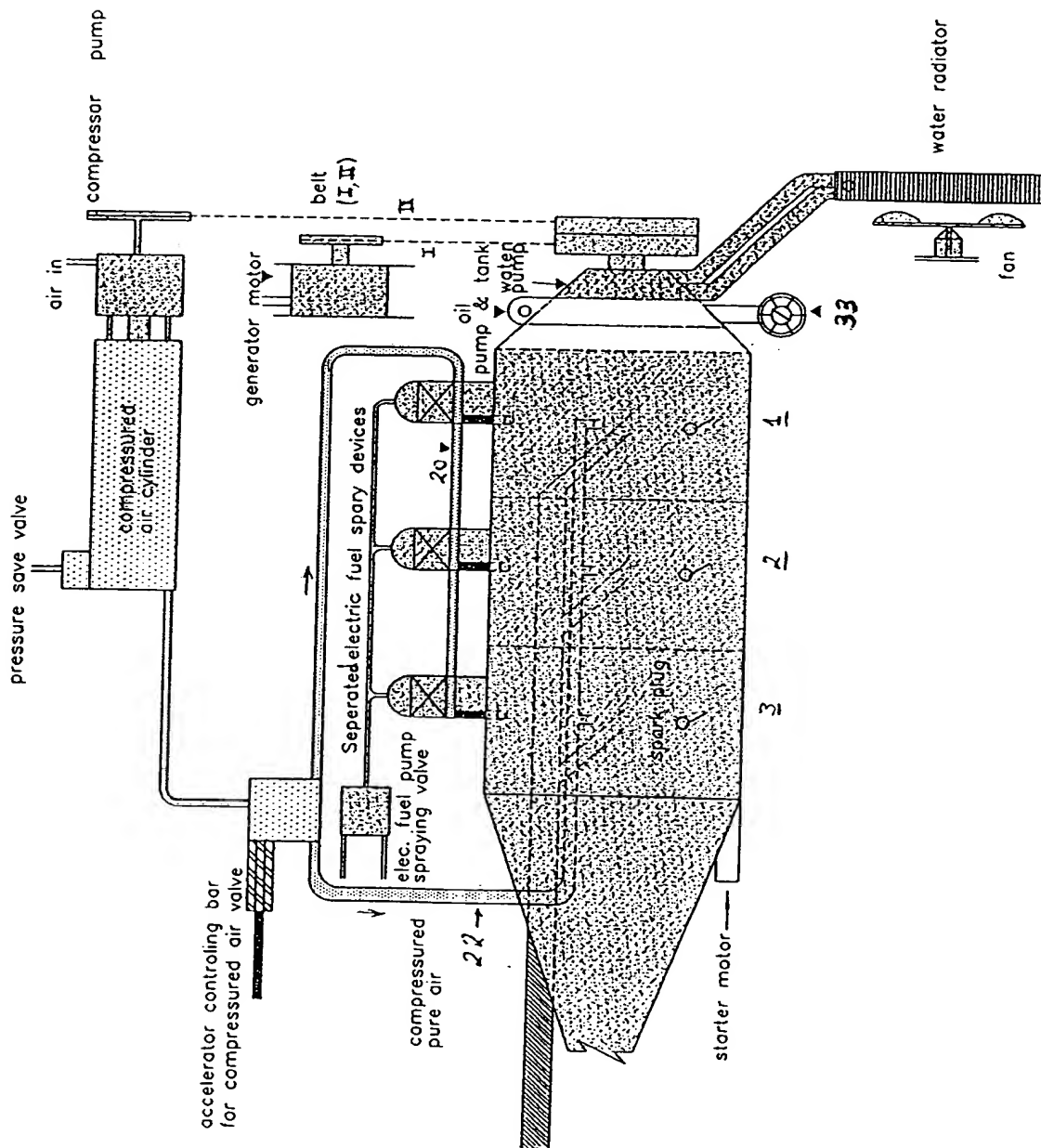
F-20C

FIG. 20/25



Proposal No: 1.
Fuel spray injection for all - fuel,air-mix inlet

FIG. 21/25



Simple ignitions distributor
for two pistons wheel x 3
mechanical or electrical

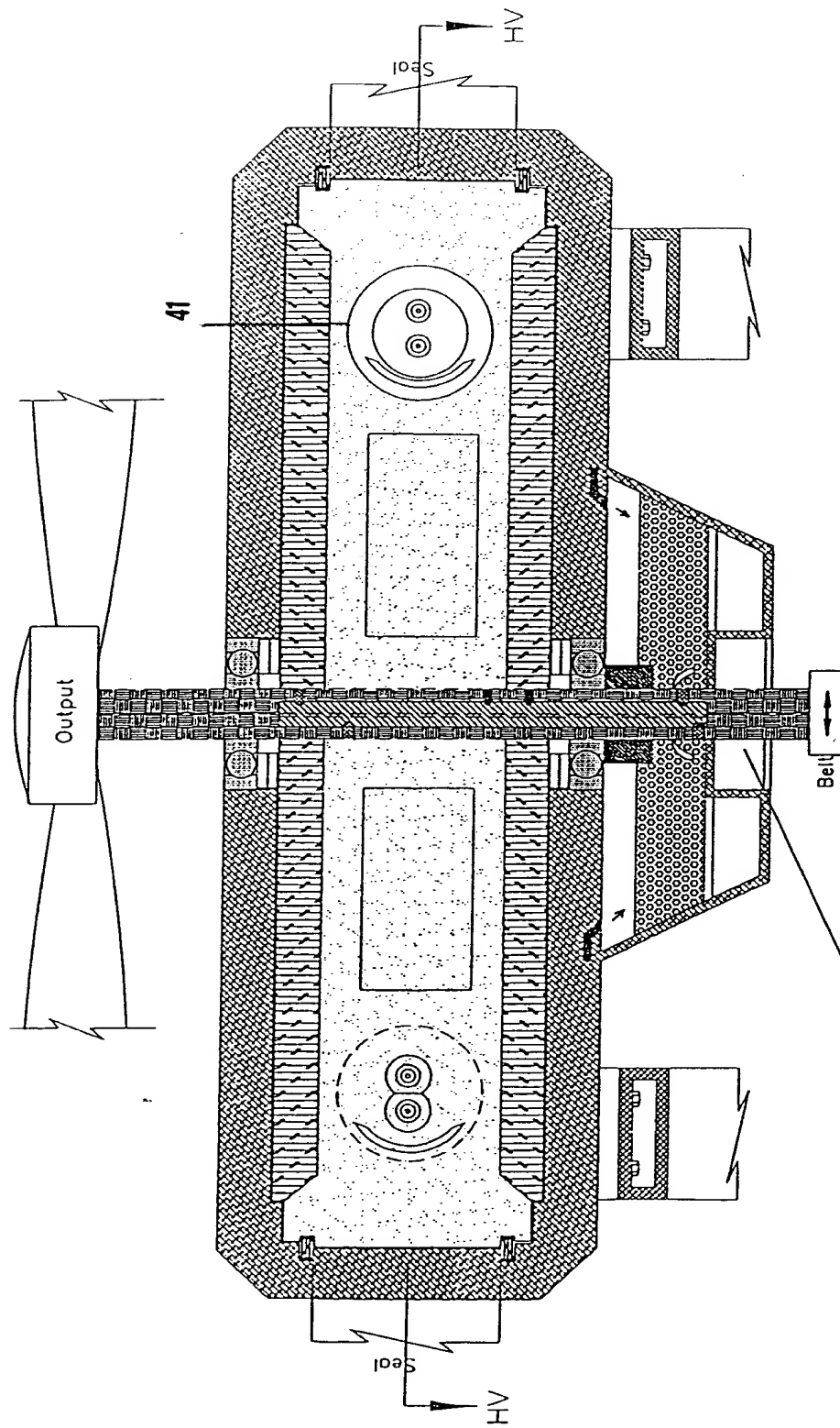
Proposal No: 2.

Fuel spray injection for each energy unit: separated - fuel air-mix. inlet

FIG. 22/25

FIG. 22/25

Typical unit with vertical crank shaft

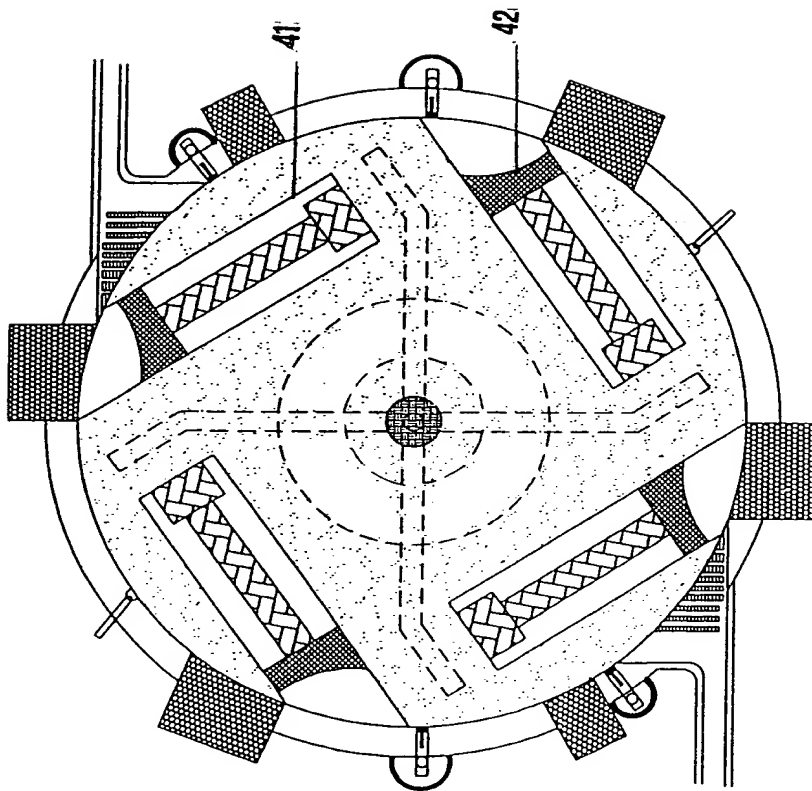


Oil pump not necessary
(Using any oil cooling proposal)

One big power wheel unit
(One big energy unit)

Super Power Wheel Unit
(Dual combustion ignition system or more)
Typical Section in vertical C. L.

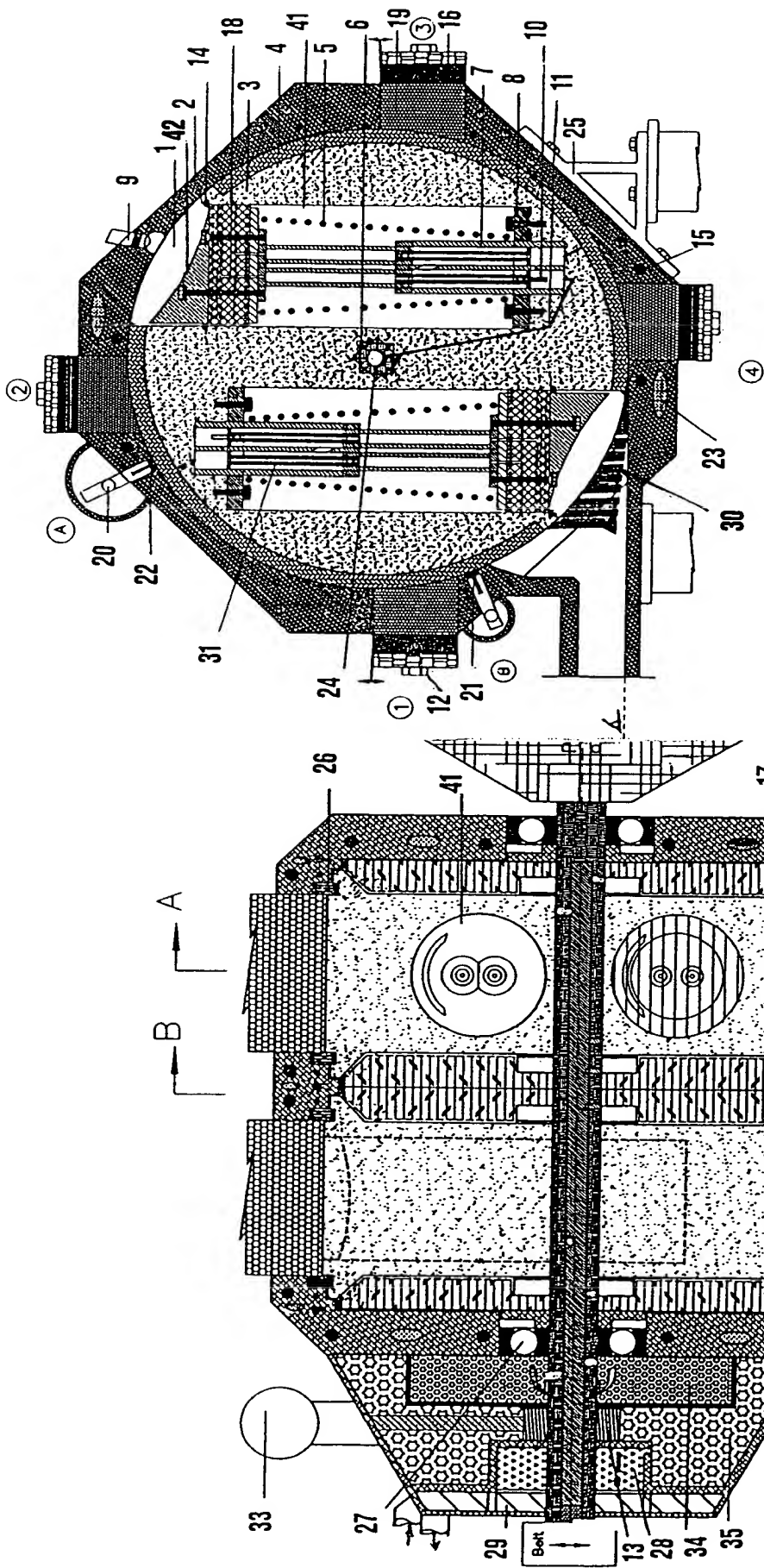
FIG. 23/25



Piston cup curve as specified

section HV - HV
A super Power Wheel Unit
(Dual combustion ignition system)

FIG. 24/25



SECTION A - A
Section plan at vertical c. l. of power wheel

FIG. 25/25

TWO POWER WHEEL UNITS
Section plan at horizontal center line (sec. H-H)

FIG. 25/25